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Foreword

This issue of the Bulletin of the University of New Hampshire provides a detailed description of curricula, courses, and requirements for study at the University.

Other information about the University — its history, its general philosophy and objectives, its buildings and equipment, its student personnel services, student organizations, methods of admission, and student fees and expenses — will be found in the *General Information 1961-1962* issue of the Bulletin.

Detailed information about financing an education at the University, including a list of scholarships and loan funds available, will be found in a publication called *Financial Aids*.

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University Calendar

1961 - 1962

Summer Session

1961

June 26	Monday	Registration, eight-week session and first four-week session
June 27	Tuesday	First class meeting, eight-week and four-week sessions
July 1	Saturday	Classes meet to make up for registration day
July 4	Tuesday	Holiday, no classes
July 10	Monday	Registration, six-week session
July 11	Tuesday	First meeting for classes in six-week session
July 15	Saturday	Classes meet, all courses, to make up for July Fourth and registration day
July 21	Friday	First four-week session ends
July 24	Monday	Registration and first meeting of classes, second four-week session
Aug. 18	Friday	Summer Session ends (all sessions)

SEMESTER I

Sept. 10	Sunday	2:00 p.m. Residence halls open for incoming freshmen
Sept. 11	Monday	9:00 a.m. Testing of freshmen not tested during summer
Sept. 12 -	Tuesday to	
17	Sunday	Orientation
Sept. 12	Tuesday	First Faculty meeting
Sept. 14	Thursday	2:00 p.m. Residence halls open for upperclassmen
Sept. 15	Friday	8:30 a.m. to 12:00; 1:30 p.m. to 4:00. Registration of all students, Memorial Union. (Student must have consulted adviser and have approved program before he appears for registration.)
Sept. 18	Monday	8:00 a.m. Classes begin
Sept. 27	Wednesday	4:30 p.m. Last day to add most academic courses
Oct. 14	Saturday	Homecoming
Oct. 16	Monday	4:30 p.m. Last day to drop courses
Nov. 6	Monday	9:00 a.m. Mid-semester reports for freshmen due in Office of the Registrar, Thompson Hall 102
Nov. 21	Tuesday	6:00 p.m. Thanksgiving recess begins; Residence halls close at 7:00 p.m.
Nov. 26	Sunday	2:00 p.m. Residence halls open
Nov. 27	Monday	8:00 a.m. Classes resume

Dec. 16 Saturday

12:30 p.m. Christmas recess begins; Residence halls close at 2:30 p.m.

1962

Jan. 2 Tuesday

2:00 p.m. Residence halls open

Jan. 3 Wednesday

8:00 a.m. Classes resume

Jan. 22 Monday

9:00 a.m. Final examinations begin

Jan. 30 Tuesday

5:00 p.m. Final examinations end

7:00 p.m. Residence halls close for Semester I

SEMESTER II

Feb. 4 Sunday

2:00 p.m. Residence halls open for Semester II

Feb. 5 Monday

8:30 a.m. to 12:00; 1:30 p.m. to 4:00. Registration of all students, Memorial Union. (Student must have consulted adviser and have approved program before he appears for registration.)

6 Tuesday

Feb. 7 Wednesday

8:00 a.m. Classes begin

Feb. 16 Friday

4:30 p.m. Last day to add most academic courses

Mar. 6 Tuesday

4:30 p.m. Last day to drop courses

Mar. 26 Monday

9:00 a.m. Mid-semester reports for freshmen due in Office of the Registrar, Thompson Hall 102

Mar. 31 Saturday

12:30 p.m. Spring recess begins; Residence halls close at 2:30 p.m.

April 8 Sunday

2:00 p.m. Residence halls open

April 9 Monday

8:00 a.m. Classes resume

(April 22 Easter Sunday)

May 5 Saturday

Parents Day, classes end at 11:00 a.m.

May 30 Wednesday

Memorial Day, no classes

June 4 Monday

9:00 a.m. Final examinations begin

June 12 Tuesday

5:00 p.m. Final examinations end; Residence halls close for Semester II at 7:00 p.m.

June 17 Sunday

Commencement Day

Board of Trustees

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PERLEY I. FITTS, B.S., COMMISSIONER OF AGRICULTURE, *ex officio*

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December 20, 1944 to June 30, 1961
Walpole, N. H.

ERNEST W. CHRISTENSEN, B.S., Vice President
July 1, 1940 to June 30, 1961
Dover, N. H.

*DEAN P. WILLIAMSON, B.S., Secretary
July 1, 1960 to June 30, 1964
Concord, N. H.

FRANK W. RANDALL, B.S., LL.D.
July 1, 1936 to June 30, 1964
Portsmouth, N. H.

MARY S. BROWN
December 20, 1944 to June 30, 1963
Center Sandwich, N. H.

MAURICE F. DEVINE, LL.B., LL.D.
December 21, 1949 to June 30, 1962
Manchester, N. H.

GEORGE L. FRAZER
July 1, 1957 to June 30, 1962
Monroe, N. H.

*FORREST M. EATON, B.S.
July 1, 1959 to June 30, 1963
Portsmouth, N. H.

BRADFORD S. BOOTHBY, B.S.
October 14, 1959 to June 30, 1963
Union, N. H.

* Elected by alumni

Officers of Administration

ELDON L. JOHNSON, *President*

JOHN F. REED, *Vice President*

JERE A. CHASE, *Assistant to the President*

ROBERT N. FAIMAN, *Dean of the College of Technology and Director of the Engineering Experiment Station*

HARRY A. KEENER, *Dean of the College of Agriculture and Director of the Agricultural Experiment Station*

DAVID C. KNAPP, *Acting Dean of the College of Liberal Arts*

ALLAN A. KUUSISTO, *Dean of the Graduate School*

NORMAN W. MYERS, *Treasurer*

CHARLES M. WHEELER, JR., *Acting Dean of Students*

ROBB G. GARDINER, *Associate Dean of Students*

ELIZABETH A. MCQUADE, *Associate Dean of Students*

THELMA BRACKETT, *Librarian*

HARRY R. CARROLL, *Director of Admissions*

PAUL E. SCHAEFER, *Registrar*

SAMUEL W. HOITT, *Director of the Cooperative Extension Service*

Administrative Staff

GEORGE W. BAMFORD, *Alumni Fund Director*

JOHN D. BARDWELL, *Audio-Visual Coordinator, University Extension Service*

DORIS BEANE, *Assistant for Institutional Studies*

KATHLEEN R. BECKINGHAM, *Counselor*

BURNELL V. BRYANT, *Alumni Executive*

ROBERT G. CONGDON, *Counselor*

HENRY W. CORROW, JR., *Extension Editor*

WILLIAM D. CRANDALL, M.D., *Assistant Director of University Health Service*

JOHN E. ENOS, *Assistant News Editor*

JOHN E. EWART, *Program Director of Memorial Union*

FRANCIS H. GORDON, *Manager, University Housing*

L. FRANKLIN HEALD, *Director of Informational Services*

DAYTON M. HENSON, *Manager, University Bookstore*

CHARLES H. HOWARTH, M. D., *Director of University Health Service*

FREDERICK M. JERVIS, Ph.D., *Director of Counseling*

C. ROBERT KEESEY, *Director of Memorial Union*

REGINALD W. KING, *Manager, Printing Service*

GEORGIA KOUGIAS, *Alumni Recorder*

EUGENE H. LEAVER, *Assistant Superintendent of Properties and Supervising Architect*

HAROLD I. LEAVITT, *Superintendent of Properties*

W. KENT MARTLING, *Assistant Treasurer*

PAUL H. MCINTIRE, Ed.D., *Director of Testing and Placement*

HARRIET B. NASON, R.N., *Supervising Nurse*

KEITH J. NIGHBERT, *Station Manager of WENH-TV, Channel 11*

UNIVERSITY OF NEW HAMPSHIRE

MARY LOU O'DONNELL, *Conference Coordinator, University Extension Service*

RONALD W. OLMSTEAD, *Controller*

RICHARD C. PLUMER, *News Editor*

ALFRED T. QUIRK, *Director of University Extension Service*

EDWARD D. SHANKEN, *Assistant Director of University Extension Service*

RUSSELL C. SMITH, *Purchasing Agent*

JANE B. STEARNS, *Financial Aids Officer*

SARAH C. THAMES, *Manager and Dietitian, University Dining Hall*

ALBERT D. VAN ALLEN, *Director of University Development*

The University Faculty and Staff

As of February 1, 1961

- ABELL, MAX F., *Extension Associate Professor Emeritus of Agricultural Economics*
B.S., Cornell University, 1914; Ph.D., *ibid.*, 1924. (1926-)
- BABCOCK, DONALD C., *Professor Emeritus of Philosophy*
B.A., University of Minnesota, 1907; M.A., *ibid.*, 1908; S.T.B., Boston University, 1912. (1918-)
- BATCHELDER, LYMAN J., *Instructor Emeritus in Mechanical Engineering, Woodshop* (1915-)
- BEGGS, ANN F., *Extension Associate Professor Emeritus of Home Economics*
B.S., Nasson College, 1947. (1917-)
- BEVAN, LAURENCE A., *Director Emeritus of the Cooperative Extension Service*
B.S., Massachusetts Agricultural College, 1931. (1946-)
- BOWLES, ELLA S., *Publications Editor Emeritus*
Plymouth Normal School, 1905. (1943-)
- CAMPBELL, WILLIS C., *Research Associate Emeritus, Engineering Experiment Station*
B.S., New Hampshire College, 1906. (1938-)
- COULTER, CHARLES W., *Professor Emeritus of Sociology*
B.A., University of Toronto, 1908; B.D., Victoria College, 1909; M.A., Yale University, 1910; Ph.D., *ibid.*, 1914. (1934-)
- ELLIS, ELIZABETH E., *Extension Associate Professor Emeritus of Home Economics*
B.S., Teachers College, Columbia University, 1927; M.A., *ibid.*, 1929. (1929-)
- HEPLER, JESSE R., *Extension Horticulturist Emeritus*
B.S., Pennsylvania State College, 1911; M.S., University of Wisconsin, 1922. (1917-)
- HITCHCOCK, LEON W., *Professor Emeritus of Electrical Engineering*
B.S., Worcester Polytechnic Institute, 1908. (1910-)
- HOWES, HORACE L., *Professor Emeritus of Physics*
B.S., Syracuse University, 1905; Ph.D., Cornell University, 1915. (1918-)
- HUDDLESTON, ERIC T., *Professor Emeritus of Architecture*
B.Arch., Cornell University, 1910. (1914-)
- JACKSON, C. FLOYD, *Professor Emeritus of Zoology*
B.A., De Pauw University, 1905; M.S., Ohio State University, 1907. (1908-)
- LATIMER, L. PHELPS, *Associate Professor Emeritus of Horticulture*
B.S., University of California, 1921; M.S., *ibid.*, 1922; Ph.D., *ibid.*, 1926. (1926-)

* Indicates part time devoted to Cooperative Extension Service.

† Indicates part time devoted to Agricultural Experiment Station.

UNIVERSITY OF NEW HAMPSHIRE

- MILLS, MARIAN E., *Assistant Professor Emeritus of Botany*
B.S., Teachers College, Columbia University, 1917; M.A., *ibid.*, 1920.
(1927-)
- O'BRIEN, DANIEL A., *County Agent Leader Emeritus*
B.S., Cornell University, 1913. (1920-)
- †O'KANE, WALTER C., *Professor Emeritus of Economic Entomology*
B.A., Ohio State University, 1897; M.A., *ibid.*, 1909; D.Sc. (Hon.), *ibid.*,
1932. (1909-)
- PARKER, CLIFFORD S., *Professor Emeritus of Languages*
A.B., Harvard University, 1912; A.M., *ibid.*, 1914; Ph.D., Columbia
University, 1925. (1931-)
- PHILIPS, THOMAS G., *Professor Emeritus of Agricultural and Biological
Chemistry*
B.S., Ohio State University, 1912; M.S., *ibid.*, 1913; Ph.D., University of
Chicago, 1918. (1925-)
- PRINCE, FORD S., *Professor Emeritus of Agronomy and Agronomist Emeritus,
Agricultural Experiment Station and Cooperative Extension Service*
B.S., University of Illinois, 1913. (1925-)
- SANBORN, MARY L., *Assistant State Club Leader Emeritus*
Oread Institute, 1904. (1915-)
- SMITH, LUCINDA P., *Associate Professor Emeritus of English*
A.B., Colby College, 1901; M.A., Boston University, 1934. (1919-)
- SMITH, TODD O., *Research Assistant Professor Emeritus of Agricultural and
Biological Chemistry*
A.B., Indiana University, 1910; M.S., New Hampshire College, 1917.
(1910-)
- STEVENS, HENRY B., *Director Emeritus of University Extension Service*
A.B., Dartmouth College, 1912. (1918-)
- TAYLOR, FREDERICK W., *Director Emeritus of Agricultural Service Depart-
ments of the College of Agriculture*
B.S., Ohio University, 1900. (1903-)
- TONKIN, JOHN C., *Instructor Emeritus in Mechanical Engineering, Machine
Shop* (1910-12, 1924-)
- YALE, WILLIAM, *Professor Emeritus of History*
Ph.B., Sheffield Scientific School, Yale University, 1910; M.A., University
of New Hampshire, 1928. (1928-)
- YEAGER, ALBERT F., *Professor Emeritus of Horticulture*
B.S., Kansas State College, 1912; M.S., Oregon Agricultural College,
1916; Ph.D., Iowa State College, 1936. (1939-)
-
- ABBOTT, HELEN D., *Head Cataloguer*
A.B., Wheaton College, 1929; S.B., in L.S., Simmons College, 1930; A.M.,
Middlebury College, 1939. (1943-)
- AGENBROAD, JAMES E., *Cataloguer*
A.B., Miami University, 1956; M.L.S., Rutgers University, 1960. (1960-)

THE UNIVERSITY FACULTY

- †ALLEN, FRED E., *Professor of Poultry Science and Veterinarian, Agricultural Experiment Station*
B.S., University of New Hampshire, 1932; D.V.M., Ohio State University, 1936. (1940-)
- †ALLEN, PETER H., *Assistant Professor of Forestry*
B.S., University of New Hampshire, 1956; M.A., Duke University, 1958. (1960-)
- ALLING, EDWIN S., *Associate Professor of Civil Engineering*
B.S.E., University of Connecticut, 1950; M. Engr., Yale University, 1951. (1952-)
- ALLMENDINGER, E. EUGENE, *Associate Professor of Mechanical Engineering*
B.S. Nav. Arch., University of Michigan, 1941; M.S. Mech. Eng., University of New Hampshire, 1950. (1958-)
- AMELL, ALEXANDER R., *Associate Professor of Chemistry*
B.S., University of Massachusetts, 1947; Ph.D., University of Wisconsin, 1950. (1955-)
- ANDERSEN, KENNETH K., *Assistant Professor of Chemistry*
B.S., Rutgers University, 1955; Ph.D., University of Minnesota, 1959. (1960-)
- ANDERSON, CHARLOTTE K., *Assistant Librarian and Documents Librarian*
B.A., University of Michigan, 1935; A.B.L.S., *ibid.*, 1936; A.M.L.S., *ibid.*, 1951. (1943-)
- ANDREWS, RICHARD A., *Assistant Professor of Agricultural Economics*
B.S., University of Maine, 1949; M.S., Pennsylvania State University, 1951; Ph.D., University of Minnesota, 1959. (1959-)
- BAIER, LEE S., *Instructor in English*
B.A., Reed College, 1948; M.A., Columbia University, 1952. (1960- .)
- BAKER, RAYMOND W., *Instructor in Business Administration, part-time*
B.S., Ind. Mgt., Georgia Institute of Technology, 1957; M.B.A., Harvard Business School, 1960. (1961-)
- BALLARD, HORACE C., *Agricultural Agent, Belknap County*
B.S., Cornell University, 1936. (1949-)
- BANKS, ARTHUR S., *Instructor in Government*
A.B., Cornell University, 1951; A.M., George Washington University, 1952. (1960-)
- BARRACLOUGH, KENNETH E., *Extension Professor of Forestry*
B.S., New York State College of Forestry, Syracuse University, 1921; M.F., Harvard University, 1940. (1926-)
- BARTLEY, CLARA H., *Research Associate in Bacteriology*
B.S., Miami University, 1923; M.A., University of Michigan, 1926; Ph.D., University of Kansas, 1935. (1945-)
- BARTLEY, IRVING D., *Assistant Professor of Music and University Carillonneur*
B.M., Syracuse University, 1933; M.M., *ibid.*, 1938. (1945-)
- BARTON, PHILIP S., *Professor of Agricultural Education and Head, Thompson School of Agriculture*
B.S., University of New Hampshire, 1928; M.Ed., *ibid.*, 1938. (1939-)

UNIVERSITY OF NEW HAMPSHIRE

- BASSETT, JOHN H., *Instructor in Economics and Business Administration*
B.S. in B.A., Boston University, 1959; A.M., *ibid.*, 1960. (1960-)
- BATCHELDER, GERALD M., *Research Assistant Professor, Engineering Experiment Station*
B.S., University of New Hampshire, 1950; M.S.C.E., Purdue University, 1952. (1953-)
- BATCHELLER, JOSEPH D., *Associate Professor of Speech and Drama*
A.B., Carnegie Institute of Technology, 1936; A.M., University of Minnesota, 1938; Ph.D., *ibid.*, 1942. (1944-)
- BATHO, EDWARD H., *Associate Professor of Mathematics*
B.S., Fordham University, 1950; M.S., University of Wisconsin, 1952; Ph.D., *ibid.*, 1955. (1960-)
- BEASLEY, WAYNE M., *Research Assistant Professor and Project Coordinator, Engineering Experiment Station*
S.B., Harvard College, 1945. (1957-)
- BECKWITH, MARIAN C., *Director and Professor of Physical Education for Women*
A.B., Oberlin College, 1935; M.Ed., University of New Hampshire, 1937. (1935-)
- BELFORD, HARRIET B., *Instructor in Physical Education for Women, part-time*
B.S., University of New Hampshire, 1954. (1961-)
- BELFORD, ROBERT E., *Captain, Instructor in Military Science*
B.S., University of New Hampshire, 1950. (1959-)
- BELL, R. VIRGINIA, *Instructor in Occupational Therapy*
B.S., University of Michigan, 1953; Certificate O.T.R., Boston School of Occupational Therapy, 1955. (1958-)
- BERGER, STANLEY I., *Assistant Professor of Psychology*
B.A., Brooklyn College, 1950; M.A., Kansas University, 1955; Ph.D., *ibid.*, 1957. (1959-)
- BERGERON, JOHN A., *Assistant Professor of Economics*
B.A., Merrimack College, 1954; Ph.D., Massachusetts Institute of Technology, 1959. (1960-)
- BINGHAM, SYLVESTER H., *Professor of English*
A.B., Dartmouth College, 1922; A.M., Harvard University, 1929; Ph.D., Yale University, 1937. (1936-)
- BLANCHARD, FLETCHER A., JR., *Associate Professor of Electrical Engineering*
B.S., Union College, 1948; M.S. in E.E., Lehigh University, 1950. (1950-)
- †BLICKLE, ROBERT L., *Professor of Entomology*
B. S., Ohio State University, 1937; M.S., University of New Hampshire, 1939; Ph.D., Ohio State University, 1942. (1938-41, 1946-)
- BLOOD, EDWARD J., *Assistant Professor of Physical Education and Athletics for Men*
B.S., University of New Hampshire, 1935. (1936-)
- *†BLOOD, PAUL T., *Associate Professor of Agronomy*
B.S., New Hampshire College, 1921; M.S., University of New Hampshire, 1924. (1921-24, 1928-)

THE UNIVERSITY FACULTY

- BOBICK, MELVIN T., *Assistant Professor of Sociology*
A.B., University of Illinois, 1949; A.M., *ibid.*, 1952; Ph.D., *ibid.*, 1958.
(1958-)
- BOSTIAN, HARRY E., *Assistant Professor of Chemical Engineering*
Sc.B.Ch.E., Bucknell University, 1954; M.Ch.E., Rensselaer Polytechnic
Institute, 1956; Ph.D., Iowa State College, 1959. (1959-)
- BOSTON, CLARENCE E., *Associate Professor of Physical Education and
Athletics for Men and Head Football Coach*
A.B., Harvard College, 1939. (1949-)
- BOTTJER, MARGUERITE E., *Research Associate in Chemistry*
A.B., Vassar College, 1953; A.M., Radcliffe College, 1954; M.S., University
of Illinois, 1957. (1959-)
- BOURNE, ELIZABETH, *Club Agent, Rockingham County*
Diploma, Framingham Normal School, 1924. (1926-)
- BOWLER, EDMOND W., *Professor of Civil Engineering*
S.B., Massachusetts Institute of Technology, 1914. (1920-)
- †BOWRING, JAMES R., *Professor of Agricultural Economics*
B.S.A., University of Manitoba, 1936; M.A., University of Alberta, 1941;
Ph.D., Iowa State College, 1944. (1948-)
- BOYAJIAN, HOWARD, *Assistant Professor of Music*
B.S., Juilliard School of Music, 1950; M.M., Oberlin Conservatory, 1951.
(1958-)
- *†BOYNTON, C. HILTON, *Professor of Dairy Science*
B.S., Iowa State College, 1934; M.S., *ibid.*, 1940. (1945-)
- BRACKETT, THELMA, *Librarian*
A.B., University of California, 1919; Certificate California State Library
School, 1920. (1942-)
- BRATTON, KARL H., *Professor of Music*
B.M., University of Kansas, 1931; M.A., Teachers College, Columbia
University, 1945. (1945-)
- BRECK, ROBERT W., *County Forester, Hillsborough County*
B.S., University of New Hampshire, 1940; M.F., Yale School of Forestry,
1941. (1947-)
- BRODY, NATHAN, *Assistant Professor of Psychology*
B.A., University of New Hampshire, 1956; M.A., University of Michigan,
1957; Ph.D., *ibid.*, 1960. (1960-)
- BROWNE, EVELYN, *Associate Professor of Physical Education for Women*
A.B., University of California, 1943; M.A., Teachers College, Columbia
University, 1943. (1943-)
- BRUNS, PAUL E., *Professor of Forestry*
A.B., New York University, 1937; M.F., Yale University, 1940; Ph.D.,
University of Washington, 1956. (1958-)
- BRYKCYNSKI, ROMAN A., *Assistant Professor of Electrical Engineering*
B.S., University of Grenoble, France, 1925; M.S., Technical University,
Warsaw, 1939. (1960-)

UNIVERSITY OF NEW HAMPSHIRE

- BUCK, CHARLES W., *County Club Agent, Hillsborough County*
B.S., University of Maine, 1951. (1955-)
- BULLOCK, WILBUR L., *Associate Professor of Zoology*
B.S., Queens College, 1942; M.S., University of Illinois, 1947; Ph.D., *ibid.*, 1948. (1948-)
- BURTON, DAVID M., *Assistant Professor of Mathematics*
B.A., Clark University, 1954; A.M., University of Rochester, 1956. (1959-)
- BUTLER, SIDNEY R., *Assistant Professor of Physics*
B.S., University of Maine, 1954; M.S., Pennsylvania State University, 1956; Ph.D., *ibid.*, 1960. (1960-)
- †BYERS, GORDON L., *Associate Professor of Agricultural Engineering*
B.S., McGill University, 1948; M.S.A., Ontario Agricultural College, 1950. (1956-)
- CAHILL, LAURENCE J., JR., *Assistant Professor of Physics*
B.S., Milit. Engr., United States Military Academy, 1946; B.S., Phys. Sci., University of Chicago, 1950; M.S. Physics, State University of Iowa, 1956; Ph.D., *ibid.*, 1959. (1959-)
- CALDWELL, S. ANTHONY, *Instructor in English*
A.B., Columbia College, 1952; M.A., Columbia University, 1953. (1957-)
- CARROLL, HARRY R., *Director of Admissions*
B.A., University of New Hampshire, 1950; M.A., *ibid.*, 1951. (1951-)
- CARROLL, HERBERT A., *Professor of Psychology*
A.B., Bates College, 1923; A.M., Brown University, 1928; Ph.D., Columbia University, 1930. (1941-)
- CASÁS, R. ALBERTO, *Professor of Languages*
Ben L., Universidad de Barcelona, 1936; A.M., Columbia University, 1947; Ph.D., *ibid.*, 1954. (1952-)
- CHAPMAN, DONALD H., *Professor of Geology*
B.A., University of Michigan, 1927; M.A., *ibid.*, 1928; Ph.D., *ibid.*, 1931. (1931-)
- CHASE, BRUCE E., *County Club Agent, Coos County*
B.S., Springfield College, 1952. (1956-)
- CHASE, DONALD H., *Assistant County Forester, Hillsborough and Rockingham Counties*
B.S., University of New Hampshire, 1957. (1957-)
- CHASSÉ, PAUL P., *Instructor in Languages*
B.A., University of New Hampshire, 1949; M.A., Laval University, 1951. (1961-)
- CHESBRO, WILLIAM R., *Assistant Professor of Bacteriology*
B.S., Illinois Institute of Technology, 1951; M.S., *ibid.*, 1955; Ph.D., *ibid.*, 1959. (1959-)
- CLARK, DAVID G., *Associate Professor of Physics*
B.A., Park College, 1938; M.S., Texas Agricultural and Mechanical College, 1940; Ph.D., Pennsylvania State College, 1947. (1947-)

THE UNIVERSITY FACULTY

- CLARK, RONALD R., *Assistant Professor of Electrical Engineering*
B.S., University of New Hampshire, 1956; M.E., Yale University, 1957.
(1957-)
- CLARK, WILLIAM E., *Assistant Professor of Mechanical Engineering,
Machine Shop*
B.S., University of New Hampshire, 1931. (1946-)
- CLARK, WINIFRED M., *Assistant Professor of The Arts*
B. S., Iowa State College, 1945; M.F.A., Cranbrook Academy of Art,
1953. (1954-)
- CLIFFORD, JACQUELINE A., *Instructor in Physical Education for Women*
B.S., Boston University, 1952; M.Ed., Rivier College, 1960. (1954-)
- CLIFFORD, ROBERT L., *County Club Agent, Belknap County*
B.S., University of New Hampshire, 1957. (1960-)
- COGAN, EUGENE J., *Major, Assistant Professor of Air Science*
- COLBY, HALSTEAD N., *Extension Associate Professor of Agricultural Engineering*
B.S., University of New Hampshire, 1930. (1946-)
- COLBY, PERLEY D., *Agricultural Agent, Hillsborough County*
B.S., University of New Hampshire, 1952. (1953-)
- COLBY, STANLEY W., *Agricultural Agent, Sullivan County*
B.S., University of New Hampshire, 1934. (1940-)
- COLLINS, DAVID A., *Instructor in Languages*
B.A., University of Maine, 1952; M.A., Yale University, 1953. (1960-)
- †COLLINS, WALTER M., *Associate Professor of Poultry Science*
B.S., University of Connecticut, 1940; M.S., *ibid.*, 1949; Ph.D., Iowa State
University, 1960. (1951-)
- COLOVOS, NICHOLAS F., *Associate Professor of Dairy Science*
B.S., University of New Hampshire, 1927; M.S., *ibid.*, 1931. (1928-)
- COMERFORD, EDWARD V., *Agricultural Agent, Cheshire County*
B.S., University of New Hampshire, 1937. (1948-)
- †CONKLIN, JAMES G., *Professor of Entomology*
B.S., Connecticut Agricultural College, 1926; M.S., University of New
Hampshire, 1929; Ph.D., Ohio State University, 1941. (1931-)
- CONNELLY, RICHARD P., *Instructor in Electrical Engineering*
B.S. in E.E., Syracuse University, 1952. (1958-)
- COOK, CHRISTOPHER C., *Instructor in The Arts*
B.A., Wesleyan University, 1954; M.F.A., University of Illinois, 1959.
(1956-57, 1959-)
- †CORBETT, ALAN C., *Associate Professor of Poultry Science*
B.S., University of Maine, 1936; M.S., *ibid.*, 1937; D.V.M., Michigan
State College, 1940. (1941-)
- CORTEZ, EDMUND A., *Professor of Speech*
B.A., Taylor University, 1923; B.O. Asbury College, 1924; B.D., Asbury
Theological Seminary, 1924; M.A., Columbia University, 1926; Ed.M.,
Harvard University, 1927. (1927-)

UNIVERSITY OF NEW HAMPSHIRE

- CROWELL, CAROLYN, *Associate Club Agent, Grafton County*
B.S., Framingham State Teachers College, 1948. (1948-)
- CRYESKY, RALPH H., *Assistant Professor of Languages*
B.A., University of Buffalo, 1947; M.A., Harvard University, 1949;
Ph.D., *ibid.*, 1953. (1951-)
- CURRIER, MURIEL B., *Home Demonstration Agent, Grafton County*
B.S., Farmington State Teachers College, 1939. (1951-52, 1953-)
- CUSHING, DANIEL, *Honorary Fellow in Metallurgy*
Ph.B., Yale University, 1912. (1952-)
- CUTTER, ARTHUR H., *Agricultural Agent, Strafford County*
B.S., University of New Hampshire, 1936; M.E., *ibid.*, 1956. (1955-)
- DAGGETT, ALBERT F., *Professor of Chemistry*
B.S., University of New Hampshire, 1928; M.S., *ibid.*, 1930; Ph.D.,
Columbia University, 1934. (1928-31, 1935-)
- DAGGETT, G. HARRIS, *Associate Professor of English*
A.B., Cornell University, 1928; M.A., *ibid.*, 1929; Ph.D., University of
North Carolina, 1941. (1942-)
- DANKO, THOMAS, *Assistant County Agricultural Agent, Merrimack County*
B.S., University of Massachusetts, 1952. (1957-)
- DANOFF, ALEXANDER P., *Assistant Professor of Languages*
A.B., New York University, 1928; A.M., *ibid.*, 1929. (1948-)
- DAVIS, BARBARA B., *Assistant County 4-H Club Agent, Strafford County*
B.S., University of New Hampshire, 1960. (1960-)
- DAVIS, HENRY A., *Associate Professor of Biochemistry*
B.S., University of New Hampshire, 1932; M.S., *ibid.*, 1934. (1932-)
- DAVIS, MARION S., *Home Demonstration Agent, Sullivan County*
B.E., Keene Normal School, 1929. (1937-)
- DAVIS, MYRA L., *Assistant Professor of Secretarial Studies*
B.S., Central Missouri State Teachers College, 1939; M.A., State University of Iowa, 1945. (1945-)
- DAVIS, RUTH E., *Extension Associate Professor of Home Economics and
Extension Specialist in Human Relations and Child Development*
B.S.Ed., Ohio University, 1953; M.A., in Home Economics, Washington
State University, 1959. (1960-)
- DAWSON, CHARLES O., *Professor of Civil Engineering*
B.C.E., Ohio State University, 1930; M.S., *ibid.*, 1940. (1930-)
- DEGLER, CARROLL M., *Professor of Economics*
A.B., University of Kansas, 1925; M.B.A., New York University, 1927.
(1928-)
- DENISON, ELLEN L., *Home Demonstration Agent, Coos County*
B.S., Framingham Teachers College, 1925; M.P.H., Massachusetts
Institute of Technology, 1930. (1935-)
- DEWEY, RICHARD S., *Professor of Sociology*
A.A., Passadena Jr. College, 1934; A.B., College of Wooster, 1936; M.A.,
Oberlin College, 1939; Ph.D., University of Wisconsin, 1941. (1958-)

THE UNIVERSITY FACULTY

- DiCECCO, LUCA, *Assistant Professor of Music*.
B.M., Indiana University, 1954; M.M., *ibid.*, 1955. (1955-)
- DISHMAN, ROBERT B., *Professor of Government*
A.B., University of Missouri, 1939; A.M., *ibid.*, 1940; Ph.D., Princeton University, 1948. (1951-)
- DODDS, JOHN A., *Assistant Professor of Dairy Science, Thompson School of Agriculture*
B.S., University of Vermont, 1936. (1953-)
- DODGE, ARTHUR G., JR., *County Forester, Carroll County*
A.A., Boston University, 1950; B.S. in Forestry, University of Massachusetts, 1953; M.S.F., Harvard University, 1961. (1960-)
- DONOVAN, EDWARD T., *Professor of Mechanical Engineering*
B.S., University of Wisconsin, 1921. (1926-)
- *†DOUGHERTY, LAWRENCE A., *Assistant Professor of Agricultural Economics*
B.S., Purdue University, 1921. (1930-)
- DREW, WILLIAM H., *Associate Professor of Agricultural Economics*
B.S., Pennsylvania State College, 1947; M.S., Rutgers University, 1949; Ph.D., Vanderbilt University, 1961. (1956-)
- DUNCAN, LILLIAN R., *Loan Librarian*
B.A., University of Oklahoma, 1933. (1934-38, 1945, 47, 1948-)
- DUNHAM, WALLACE C., *Associate Extension Economist, Agricultural Economics*
B.S., University of Vermont, 1952; M.S., Ohio State University, 1956. (1961-)
- DUNLOP, WILLIAM R., *Associate Professor of Poultry Science*
D.V.M., V.S., Ontario Veterinary College, 1938. (1950-)
- †DUNN, GERALD M., *Associate Professor of Agronomy*
B.S., West Virginia University, 1948; M.S., Purdue University, 1950; Ph.D., *ibid.*, 1951. (1951-)
- †DUNN, STUART, *Professor of Botany*
B.S., University of Minnesota, 1923; M.S., Iowa State College, 1925; Ph.D., University of Minnesota, 1931. (1926-)
- †DURGIN, OWEN B., *Assistant Professor of Sociology*
B.S., Gorham State Teachers College, 1946; M.A., University of New Hampshire, 1951. (1950, 1951-)
- DURYEA, WALTER R., *Assistant Professor of Psychology*
A.B., Rutgers University, 1954; M.A., University of Connecticut, 1956; Ph.D., Florida State University, 1960. (1960-)
- EGGERT, RUSSELL, *Associate Professor of Horticulture*
B.S., Michigan State College, 1929; M.S., *ibid.*, 1939. (1944-46, 1948-)
- EMERY, HARVARD B., *Instructor in Mechanical Engineering*
Cert. in M.E., Lowell Institute, 1938. (1954-)
- FAIMAN, ROBERT N., *Dean of the College of Technology, Director of the Engineering Experiment Station, and Professor of Electrical Engineering*
B.S.E.E., North Dakota State College, 1947; M.S.E.E., University of Washington, 1948; Ph.D., Purdue University, 1956. (1959-)

UNIVERSITY OF NEW HAMPSHIRE

- FARRELL, PATRICIA, *Instructor and Recreation Specialist in Physical Education for Women*
B.S., Pennsylvania State University, 1956; M.E., University of Minnesota, 1958. (1958-)
- FASANELLI, JAMES A., *Assistant Professor of The Arts*
A.B., State University of Iowa, 1951; A.M., Harvard University, 1958. (1960-)
- FAULKNER, JAMES C., *Associate Professor of Languages*
B.L., France, 1937; C.E.S., France, 1937; D.I.O., Universite de Paris, 1938; M.A., Universite Laval, 1947; D.Un., *ibid.*, 1950. (1948-)
- FENTON, PAUL J., *Agricultural Agent, Merrimack County*
B.S., University of New Hampshire, 1929; M.S., Cornell University, 1941. (1952-)
- FINNEGAN, THEODORE J., *Captain, Instructor in Air Science*
B.S., University of New Hampshire, 1948; M.A., *ibid.*, 1955. (1958-)
- FITCH, EZRA C., *Assistant Reference Librarian*
A.B., Harvard College, 1946; M.A., Brown University, 1955; M.S. in L.S., Simmons College School of Library Science, 1957. (1957-)
- FORD, JOSEPH P., *Instructor in Government*
B.A., University of New Hampshire, 1956; M.P.A., Harvard University, 1957. (1959-)
- FRICK, GEORGE E., *Adjunct Professor, College of Agriculture*
B.S., University of Connecticut, 1943; M. S., *ibid.*, 1947. (1957-)
- FROST, ALBERT D., *Associate Professor of Electrical Engineering*
B.S., Tufts College, 1944; A.M., Harvard University, 1947; Sc.D., Massachusetts Institute of Technology, 1952. (1957-)
- FUNKHOUSER, JAMES A., *Professor of Chemistry*
B.S., Carnegie Institute of Technology, 1925; Ph.D., Ohio State University, 1930. (1930-)
- GARDINER, ROBB G., *Associate Dean of Students*
B.A., Dartmouth College, 1933; M.A., Syracuse University, 1948; Ed.D., *ibid.*, 1956. (1956-)
- GEORGE, ERNEST A., *Associate County Agricultural Agent, Hillsborough County*
B.S., University of New Hampshire, 1951. (1955-)
- GIBSON, MERRITT A., *Assistant Professor of Zoology*
B.Sc., Acadia University, 1951; M. Sc., *ibid.*, 1953; Ph.D., McGill University, 1957. (1957-)
- GILMAN, PAUL A., *Associate Professor of Farm Mechanics, Thompson School of Agriculture*
B.S., University of Vermont, 1938; M.S., Pennsylvania State University, 1951. (1945-)
- GILMORE, ROBERT C., *Assistant Professor of History*
A.B., University of Vermont, 1944; M.A., McGill University, 1947; M.A., Yale University, 1951; Ph.D., *ibid.*, 1954. (1952-)

THE UNIVERSITY FACULTY

- GOFFE, LEWIS C., *Assistant Professor of English*
B.S., University of New Hampshire, 1935; M.A., *ibid.*, 1946. (1946-)
- GOODRICH, ROBERT E., *Assistant County Agricultural Agent, Rockingham County*
B.S., University of New Hampshire, 1958. (1958-)
- GOODRICH, ROBERT W., *Instructor in Electrical Engineering*
B.S.E.E., University of New Hampshire, 1957; M.S.E.E., Purdue University, 1958. (1959-)
- GRAHAM, HERBERT W., *Lecturer in Zoology*
B.S., University of Pittsburg, 1929; M.A., Stanford University, 1934; Ph.D., *ibid.*, 1938. (1957-)
- GRANGER, RALPH H., *Associate Professor of Poultry Science, Thompson School of Agriculture*
B.S., Massachusetts State College, 1935; M.S., *ibid.*, 1939. (1946-)
- GREENLEAF, WILLIAM, *Assistant Professor of History*
B.S.S., The City College, New York, 1942; M.A., Columbia University, 1948; Ph.D., *ibid.*, 1955. (1958-)
- GRINNELL, HAROLD C., *Professor of Agricultural Economics*
B.S., Cornell University, 1921; M.S., *ibid.*, 1930; Ph.D., *ibid.*, 1941. (1932-)
- GUTHRIE, AUDREY G., *Extension Associate Professor of Home Economics*
B.S., in Ed., Madison College, 1942; M.S., Cornell University, 1959. (1959-)
- HAENDLER, HELMUT M., *Professor of Chemistry*
B.S., Northeastern University, 1935; Ph.D., University of Washington, 1940. (1945-)
- HAHN, THOMAS J., *Club Agent, Grafton County*
B.S., University of New Hampshire, 1952. (1954-)
- HALL, HARRY H., *Professor of Physics*
B.S., Union College, 1926; Ph.D., Harvard University, 1934. (1940-)
- HALL, JAMES W., *Assistant County Agricultural Agent, Coos County*
B.S., University of New Hampshire, 1957. (1959-)
- HAM, RUTH S., *Home Demonstration Agent, Strafford County*
B.S., University of New Hampshire, 1924. (1955-)
- HAMMOND, JOHN B., *Captain, Instructor in Military Science*
B.S., University of New Hampshire, 1960. (1960-)
- HARTWELL, WILLIAM H., *Associate Professor of Physics*
B.S., Boston University, 1924; M.A., Wesleyan University, 1927. (1929-)
- HARWOOD, WILFRED T., *Senior Cataloguer*
B.A., University of New Hampshire, 1952; M.S., Simmons College, 1957. (1944-51, 1953-)
- HASLERUD, GEORGE M., *Professor of Psychology*
B.A., University of Minnesota, 1930; Ph.D., *ibid.*, 1934. (1945-)
- HATCH, JOHN W., *Associate Professor of The Arts*
Diploma, Massachusetts School of Art, 1941; B.F.A., Yale University School of the Fine Arts, 1948; M.F.A., *ibid.*, 1949. (1949-)

UNIVERSITY OF NEW HAMPSHIRE

- HEILBRONNER, HANS, *Associate Professor of History*
A.B., University of Michigan, 1949; A.M., *ibid.*, 1950; Ph.D., *ibid.*, 1954.
(1954-)
- HENDERSON, ANNE, *Assistant Professor of Occupational Therapy*
A.A., University of California, 1943; B.S., University of Southern
California, 1946. (1957-)
- HENNESSY, WILLIAM G., *Professor of English*
A.B., Boston University, 1916; A. M., *ibid.*, 1924. (1923-)
- †HENRY, WILLIAM F., *Professor of Agricultural Economics*
B.S., Louisiana State University, 1940; M.S., University of Connecticut,
1942. (1952-)
- *†HIGGINS, LEROY J., *Associate Professor of Agronomy*
B.S., University of New Hampshire, 1923. (1927-28, 1929-)
- HOCHGRAF, FREDERICK G., *Assistant Professor of Mechanical Engineering*
B.Met.E., Rensselaer Polytechnic Institute, 1954; M.S., in Metallurgy,
Cornell University, 1958. (1958-)
- †HOCKER, HAROLD W., JR., *Assistant Professor of Forestry*
B.S.F., Pennsylvania State College 1949; M.F., North Carolina State
College, 1952; D.F., Duke University, 1955. (1955-)
- †HODGDON, ALBION R., *Professor of Botany*
B.S., University of New Hampshire, 1930; M.S., *ibid.*, 1932; Ph.D.,
Harvard University, 1936. (1930-32, 1936-)
- HOGAN, JOHN A., *Professor of Economics*
A.B., University of Washington, 1932; A.M., *ibid.*, 1934; M.A., Harvard
University, 1948; Ph.D., *ibid.*, 1952. (1947-)
- HOITT, SAMUEL W., *Director of the Cooperative Extension Service*
B.S., University of New Hampshire, 1928; M.S., *ibid.*, 1931. (1929-)
- HOLDEN, JOHN T., *Professor of Government*
A.B., Wesleyan University, 1936; M.P.A., Harvard University, 1941;
M.A., *ibid.*, 1942; Ph.D., *ibid.*, 1943. (1947-)
- HOUSTON, ROBERT E., JR., *Assistant Professor of Physics*
B.S., Michigan State University, 1949; M.S., *ibid.*, 1951; Ph.D., Pennsyl-
vania State University, 1957. (1957-)
- HOWARTH, CHARLES H., *Director of the University Health Service*
B.S., Bates College, 1943; M.D., Tufts Medical School, 1946. (1955-)
- HRABA, JOHN B., *Professor of Electrical Engineering*
B.S., University of New Hampshire, 1948; M.Eng., Yale University,
1949; Ph.D., University of Illinois, 1955. (1949-)
- HUBBARD, FRANCES R., *County Club Agent, Sullivan County*
B.S., University of Connecticut, 1958. (1958-)
- HURST, M. JEAN, *Home Demonstration Agent, Merrimack County*
B.S., Nasson College, 1950. (1959-)
- †HUSCH, BERTRAM, *Associate Professor of Forestry*
B.S., New York State College of Forestry, 1943; M.F., *ibid.*, 1947; Ph.D.,
University of Michigan, 1952. (1951-)

THE UNIVERSITY FACULTY

- IDDLES, HAROLD A., *Professor of Chemistry*
B.S., Michigan State College, 1918; M.S., University of Iowa, 1921; Ph.D., Columbia University, 1925. (1929-)
- JACOBSEN, ERLEND E., *Instructor in English*
A.B., Dartmouth College, 1956; M.A., Johns Hopkins University, 1957. (1958-)
- JAMES, JESSE, *State Club Leader, Cooperative Extension Service*
B.S., University of Georgia, 1937; M.S., *ibid.*, 1951. (1957-)
- JAMES, MARION E., *Assistant Professor of History*
B.A., University of New Hampshire, 1940; M.A., Radcliffe College, 1949; Ph.D., *ibid.*, 1955. (1955-)
- JELLISON, CHARLES A., JR., *Assistant Professor of History*
A.B., Stanford University, 1944; M.A., *ibid.*, 1948; Ph.D., University of Virginia, 1956. (1956-)
- JERVIS, FREDERICK M., *Director of Counseling and Lecturer in Psychology*
B.A., University of New Hampshire, 1948; M.A., *ibid.*, 1949; Ph.D., Columbia University, 1958. (1952-)
- JOHNSON, ARTHUR W., *Professor of Business Administration*
B.B.A., College of Business Administration, Boston University, 1922; M.B.A., *ibid.*, 1929; C.P.A. (1920-)
- JOHNSON, ELDON L., *President*
A.B., Indiana State Teachers College, 1929; Ph.M., University of Wisconsin, 1933; Ph.D., *ibid.*, 1939; LL.D., University of Rhode Island, 1959. (1955-)
- JOHNSON, GIBSON R., *Associate Professor of History*
A.B., Muskingum College, 1916; M.A., Princeton University, 1920; Ph.D., University of Edinburgh, 1922. (1932-)
- JOHNSON, RUSSELL W., *Instructor in Economics and Business Administration*
B.S. in B.A., Boston University, 1954; Ed.M., *ibid.*, 1960. (1960-)
- JONES, MARION E., *Captain, Instructor in Military Science*
B.S., University of Maryland, 1956. (1958-)
- JONES, PAUL R., *Assistant Professor of Chemistry*
B.A., Albion College, 1952; Ph.D., University of Illinois, 1956. (1956-)
- JORDAN, ROBERT W., *Associate Professor of Philosophy*
A.B., Harvard College, 1939; M.A., Harvard University, 1947; Ph.D., *ibid.*, 1950. (1955-)
- JORGENSEN, EUGENE C., *Assistant Professor of Education*
B.S., Gorham State Teachers College, 1942; M.A., University of Maine, 1950; Ed.D., Teachers College, Columbia University, 1954. (1960-)
- KAUPPINEN, TENHO S., *Associate Professor of Mechanical Engineering*
B.S., University of New Hampshire, 1939; M.S., *ibid.*, 1947. (1939-)
- KAY, BRIAN R., *Associate Professor of Psychology*
B.A., University of British Columbia, 1948; M.A., *ibid.*, 1949; Ph.D., University of London, 1952. (1956-)

UNIVERSITY OF NEW HAMPSHIRE

- †KEENER, HARRY A., *Dean of the College of Agriculture, Director of the Agricultural Experiment Station, and Professor of Dairy Science*
B.S., Pennsylvania State College, 1936; M.S., West Virginia University, 1938; Ph.D., Pennsylvania State College, 1941. (1941-)
- KENNEDY, KEVIN B., *Associate Agricultural Agent, Grafton County*
B.S.A., Ontario Agricultural College, 1949. (1955-)
- KENNEDY, ROBERT C., *Associate Professor of Horticulture, Thompson School of Agriculture*
B.V.A., Massachusetts State College, 1940. (1941-)
- KICHLINE, WILLIAM L., *Professor of Mathematics*
B.A., Lehigh University, 1924; M.S., *ibid.*, 1928. (1931-)
- KILPATRICK, LOUISE C., *State Home Demonstration Leader, Cooperative Extension Service*
B.S., Pennsylvania State University, 1942; M.S., Cornell University, 1956. (1958-)
- KILPATRICK, R. A., *Adjunct Professor, College of Agriculture*
B.S., Oklahoma A. & M. College, 1948; M.S., *ibid.*, 1949; Ph.D., University of Wisconsin, 1951. (1957-)
- KIMBALL, HAROLD E., JR., *Riding Instructor, Department of Animal Science*
A. B., Bowdoin College, 1950. (1957-)
- KIMBALL, ROBERT O., *Assistant Professor of Mathematics*
B.S., University of New Hampshire, 1941; M.A., *ibid.*, 1952. (1946-)
- *KITCHIN, JOHN T., *Associate Professor of Horticulture and Extension Horticulturist*
B.S., University of Rhode Island, 1951; M.S., Rutgers University, 1953; Ph.D., *ibid.*, 1956. (1956-)
- KNAPP, DAVID C., *Acting Dean of the College of Liberal Arts and Associate Professor of Government*
A.B., Syracuse University, 1947; A.M., University of Chicago, 1948; Ph.D., *ibid.*, 1953. (1953-)
- KNOX, HARRY B., *Associate Club Agent, Rockingham County*
B.S., University of New Hampshire, 1950. (1954-)
- KOCH, WAYNE S., *Professor of Education*
B.S., Muhlenberg College, 1941; Ed.M., Harvard University, 1945. (1945-)
- †KOLEGA, JOHN J., *Associate Professor of Agricultural Engineering*
B.S., University of Connecticut, 1950; M.S., Oklahoma A. & M. College 1952. (1957-)
- KONRAD, ALEXANDER N., *Assistant Professor of Languages*
M.A., University of Pennsylvania, 1955; Ph. D., *ibid.*, 1959. (1960-)
- KUIVILA, HENRY G., *Professor of Chemistry*
B.S., Ohio State University, 1942; M.A., *ibid.*, 1944; Ph.D., Harvard University, 1948. (1948-)

THE UNIVERSITY FACULTY

- KUUSISTO, ALLAN A., *Dean of the Graduate School, Coordinator of Research, and Professor of Government*
A.B., Wittenberg College, 1942; A. M., Harvard University, 1948; Ph.D., *ibid.*, 1950. (1948-)
- LARSON, ROBERT N., *Assistant Professor of Government*
A.B., Columbia University, 1941; A.M., Tufts University, 1947; A.M., Boston University, 1951; Ph.D., *ibid.*, 1960. (1960-)
- LAURENT, JOHN L., *Assistant Professor of The Arts*
B.F.A., Syracuse University, 1948; M.A.T., Indiana University, 1954. (1954-)
- LAVINE, IRVIN M., *Professor of Chemical Engineering*
B.S., University of Minnesota, 1924; Ph.D., *ibid.*, 1930. (1948-49, 1951-)
- LAVOIE, MARCEL E., *Assistant Professor of Zoology*
B.A., St. Anselm's College, 1940; M.A., University of New Hampshire, 1950; Ph.D., Syracuse University, 1956. (1950-52, 1955-)
- LEE, WILLIAM R., JR., *Assistant Professor of Entomology*
B.S.A., University of Arkansas, 1952; M.S., University of Wisconsin, 1953; Ph.D., *ibid.*, 1956. (1956-)
- LEIGHTON, CHARLES H., *Instructor in Languages*
A.B., Harvard College, 1951; M.A., Harvard University, 1953. (1956-)
- LEIGHTON, ROGER S., *County Forester, Belknap-Strafford Area*
B.S., University of New Hampshire, 1941. (1950-)
- LEPKE, ARNO K., *Professor of Languages*
Ph.D., University of Marburg, Germany, 1947. (1949-)
- LESTER, JUNE R., *Home Demonstration Agent-at-Large*
B.E., Keene Teachers College, 1949. (1958-)
- LITTLEFIELD, RALPH B., *Extension Agronomist and County Agent Leader*
B.S., University of New Hampshire, 1927. (1940-)
- LOCKWOOD, JOHN A., *Professor of Physics*
A.B., Dartmouth College, Thayer School of Engineering, 1941; M.S., Lafayette College, 1943; Ph.D., Yale University, 1948. (1948-)
- LOHNES, PAUL R., *Assistant Professor of Education*
A.B., Yale University, 1950; M.A., Harvard University, 1952; Ph.D., *ibid.*, 1960. (1958-)
- LONG, DAVID F., *Professor of History*
A.B., Dartmouth College, 1939; A.M., Columbia University, 1946; Ph.D., *ibid.*, 1950. (1948-)
- †LOUGHLIN, MARGARET E., *Assistant Professor of Biochemistry*
A.B., Regis College, 1942; M.S., University of New Hampshire, 1953. (1951-)
- †LUCEY, ROBERT F., *Assistant Professor of Agronomy*
B.V.A., University of Massachusetts, 1950; M.S., University of Maryland, 1954; Ph.D., Michigan State University, 1959. (1958-)

UNIVERSITY OF NEW HAMPSHIRE

- LUNDBERG, DONALD E., *Professor of Hotel Administration*
B.A., Iowa State Teachers College, 1941; M.A., Duke University, 1942;
Ph.D., Cornell University, 1946. (1960-)
- LUNDHOLM, CARL, *Director and Professor of Physical Education and Athletics for Men*.
B.S., New Hampshire College, 1921; M.A., Columbia University, 1939, (1928-)
- LUNDHOLM, DONALD A., *Major, Assistant Professor of Air Science*
B.S., U. S. Military Academy, 1946. (1960-)
- LYLE, GLORIA G., *Assistant Professor of Chemistry, Part-time*
B.A., Vanderbilt University, 1944; M.S., Emory University, 1946; Ph.D., University of New Hampshire, 1958. (1951-)
- LYLE, ROBERT E., JR., *Professor of Chemistry*
B.A., Emory University, 1945; M.S., *ibid.*, 1946; Ph.D., University of Wisconsin, 1949. (1951-)
- MAIRHUBER, JOHN C., *Assistant Professor of Mathematics*
B.S., University of Rochester, 1942; M.A., *ibid.*, 1950; Ph.D., University of Pennsylvania, 1959. (1958-)
- MANTON, ROBERT W., *Professor of Music*
Harvard University, 1918. (1923-)
- MARSH, JOHN F., *Research Associate, Chemistry*
B.Sc., University College, London, 1957; Ph.D., Manchester College of Science and Technology, England, 1960. (1960-)
- MARSHALL, THOMAS O., *Professor of Education*
A.B., Colgate University, 1929; Ed.M., University of Buffalo, 1933; Ed.D., Harvard University, 1941. (1947-)
- MARSTON, PHILIP M., *Professor of History*
B.A., University of New Hampshire, 1924; M.A., *ibid.*, 1927. (1924-)
- MARTENS, HARRY G. P. T., *Instructor in English*
B.A., St. Catherine's Society, Oxford, 1958.
- MARTIN, HORACE S., JR., *Assistant Professor of Physical Education and Athletics for Men*
B.S., University of New Hampshire, 1941; M.Ed., *ibid.*, 1953. (1948-)
- MAYNARD MAX S., *Associate Professor of English*
B.A., University of British Columbia, 1937. (1946-)
- McELROY, JOSEPH P., *Instructor in English*
B.A., Williams College, 1951; M.A., Columbia University, 1952. (1956-)
- McGRATH, WILLIAM E., *Branch Librarian*
A.B., University of Massachusetts, 1952; M.A.L.S., University of Michigan, 1956. (1956-)
- McINTIRE, PAUL H., *Director of Testing and Placement*
B.A., University of New Hampshire, 1942; A.M., Boston University, 1945; Ed.D., *ibid.*, 1957. (1946-)
- McQUADE, ELIZABETH A., *Associate Dean of Students*
A.B., The State University of Iowa, 1950; A.M., University of Chicago, 1955. (1960-)

THE UNIVERSITY FACULTY

- MEADER, ELWYN M., *Associate Professor of Horticulture*
B.S., University of New Hampshire, 1937; M.S., Rutgers University, 1941. (1948-)
- MELVIN, DONALD W., *Assistant Professor of Electrical Engineering*
B.S., University of New Hampshire, 1955; M.E., Yale University, 1957. (1957-)
- MENGE, CARLETON P., *Associate Professor of Education*
B.S., Springfield College, 1939; M.A., University of Chicago, 1940; Ph.D., *ibid.*, 1948. (1948-)
- MERRITT, EDWARD H., *County Club Agent, Cheshire County*
B.S., University of Massachusetts, 1956. (1956-57, 1959-)
- MERRITT, RICHARD D., *Assistant Professor of The Arts and University Photographer*
Rochester Institute of Technology, 1948. (1948-)
- METCALF, THEODORE G., *Associate Professor of Bacteriology*
B.S., Massachusetts College of Pharmacy, 1940; Ph.D., University of Kansas, 1950. (1956-)
- MEYERS, T. RALPH, *Professor of Geology*
B.A., Ohio State University, 1926; M.A., *ibid.*, 1929. (1927-)
- MICHAEL, JOSEPH E., JR., *Instructor in Economics and Business Administration, Part-time*
A.B., Dartmouth College, 1948; LL.B., Boston University School of Law, 1950. (1960-)
- MICHMAN, RONALD D., *Assistant Professor of Economics and Business Administration*
B.S., New York University, 1953; M.A., *ibid.*, 1957. (1960-)
- MILLER, EDMUND G., *Assistant Professor of English*
A.B., Dartmouth College, 1943; M.A., Columbia University, 1947; Ph.D., *ibid.*, 1955. (1951-)
- MILLS, JOYCE, *Instructor in Physical Education for Women*
B. S., Georgia State College for Women, 1949; M.S., Phys. Ed., University of Tennessee, 1958. (1957-)
- MILNE, LORUS J., *Professor of Zoology*
B.A., University of Toronto, 1933; M.A., Harvard University, 1934; Ph.D., *ibid.*, 1936. (1948-)
- MOORADIAN, ANDREW T., *Assistant Professor of Physical Education and Athletics for Men*
B.S., University of New Hampshire, 1948. (1950-)
- MOORE, ASHER, *Professor of Philosophy*
A.B., Wesleyan University, 1940; M.A., Harvard University, 1942; Ph.D., *ibid.*, 1948. (1961-)
- MOORE, GEORGE M., *Professor of Zoology*
A.Sc., University of the City of Toledo, 1926; B.S., Otterbein College, 1928; M.S., University of Michigan, 1932; Ph.D., *ibid.*, 1938. (1944-)
- †MOORE, HERBERT C., *Associate Professor of Dairy Science*
B.S., Purdue University, 1923; M.S., University of Minnesota, 1925. (1928-)

UNIVERSITY OF NEW HAMPSHIRE

- †MORROW, KENNETH S., *Professor of Dairy Science*
B.S., University of Minnesota, 1918; M.S., *ibid.*, 1925. (1934-)
- MOSBERG, WILLIAM, *Assistant Professor of Mechanical Engineering*
B.S.M.E., Columbia University, 1956; Master of Engineering, Yale, 1960.
(1958-)
- MOSES, RUTH E., *Assistant Order Librarian*
A.B., Bates College, 1927; B.L.S., School of Library Science, Columbia University, 1930; A.M., Teachers College, Columbia University, 1943.
(1957-)
- MOWER, LYMAN, *Associate Professor of Physics*
B.S., University of California, 1949; Ph.D., Massachusetts Institute of Technology, 1953. (1957-)
- MULHERN, JOHN E., JR., *Associate Professor of Physics*
B.S., Oklahoma Agricultural and Mechanical College, 1948; M.A., Boston University, 1949; Ph.D., *ibid.*, 1954. (1954-)
- MUNROE, M. EVANS, *Professor of Mathematics*
B.A., University of Texas, 1940; Sc.M., Brown University, 1941; Ph.D., *ibid.*, 1945. (1959-)
- MURDOCH, JOSEPH B., *Associate Professor of Electrical Engineering*
B.S., Case Institute of Technology, 1950; M.S., University of New Hampshire, 1955. (1952-)
- MYERS, NORMAN W., *Treasurer*
B.S., University of New Hampshire, 1950. (1953-)
- †NAST, CHARLOTTE G., *Associate Professor of Botany*
B.A., University of Wisconsin, 1927; M.A., *ibid.*, 1929; Ph.D., University of California, 1948. (1948-)
- NEWMAN, BARBARA K., *Associate Professor of Physical Education for Women*
B.S., Russell Sage College, 1939; M.Ed., St. Lawrence University, 1948.
(1948-)
- NICHOLS, NICHOLAS P., *Instructor in English*
B.A., Columbia College, 1955; M.A., Columbia University, 1956. (1957-)
- NICHOLSON, ARTHUR R., JR., *Instructor in Civil Engineering*
B.S., Tufts University, 1956. (1958-)
- NICOLOFF, PHILIP L., *Assistant Professor of English*
B.A., University of California, 1949; M.A., Columbia University, 1952; Ph.D., *ibid.*, 1959. (1954-)
- NIELSON, MELVILLE, *Associate Professor of Sociology and Assistant Dean, College of Liberal Arts*
B.S., Bowling Green State University, 1942; M.A., Ohio State University, 1947; Ph.D., *ibid.*, 1955. (1950-)
- NISSEN, HARRIET J., *Home Demonstration Agent, Hillsborough County*
B.S., Nasson College, 1941; M.Ed., Cornell University, 1953. (1956-)
- NOTHMANN, GERHARD S., *Consulting Psychiatrist*
M.D., University of Bern, 1938. (1952-)

THE UNIVERSITY FACULTY

- NULSEN, WILLIAM B., *Professor of Electrical Engineering*
B.S., California Institute of Technology, 1918; M.S., University of New Hampshire, 1930. (1926-)
- O'CONNELL, ELIAS M., *Instructor in Mechanical Engineering*
Graduate, Wentworth Institute, course in forging, hardening and tempering, 1923; Graduate, two-year course in pattern making, *ibid.*, 1925. (1925-)
- OLSON, E. WILLIAM, *Associate Professor of Physical Education and Athletics for Men*
B.S., Boston University, 1940; M.S., University of Wisconsin, 1950. (1956-)
- OLSSON, GUNNAR B., *Extension Assistant Professor of Dairy Science*
B.S., New Hampshire College, 1922. (1944-)
- OWEN, ALLAN, *Assistant Professor of Music*
B.M., Cincinnati Conservatory of Music, 1950; M.M., *ibid.*, 1950. (1950-)
- OWEN, MARGARET, *Order Librarian*
A.B., Mount Holyoke College, 1919. (1943-)
- OWENS, ROBERT H., *Associate Professor of Mathematics*
B.S., Webb Institute of Naval Architecture, 1944; M.A., Columbia University, 1948; Ph.D., California Institute of Technology, 1952. (1956-)
- PALMER, ROBERT S., *Adjunct Professor, College of Agriculture*
B.S., Oklahoma A. & M., College, 1953; M.Ed., University of New Hampshire, 1957. (1958-)
- PALMER, STUART H., *Associate Professor of Sociology*
B.A., Yale College, 1949; M.A., Yale University, 1951; Ph.D., *ibid.*, 1955. (1955-)
- PARTRIDGE, ALLAN B., *Associate Professor of History*
A.B., Clark University, 1922; A.M., *ibid.*, 1923. (1925-)
- PEARCE, RUTH E., *Assistant Professor of Home Economics*
B.S., Pennsylvania State University, 1940; M.S., Cornell University, 1948. (1958-)
- PERCIVAL, GORDON P., *Associate Professor of Biochemistry*
B.S., Massachusetts Agricultural College, 1924; M.S., *ibid.*, 1926. (1926-)
- PERKINS, DONALD M., *Assistant Professor of Mathematics*
B.S., University of New Hampshire, 1931; M.S., *ibid.*, 1933. (1931-)
- PERRY, ELIZABETH M., *Home Demonstration Agent, Cheshire County*
B.S., University of New Hampshire, 1949. (1949-)
- PERRY, ERROL C., *Assistant Professor of Farm Management, Thompson School of Agriculture*
B.S., Massachusetts State College, 1920. (1929-42, 1946-)
- PETERS, JOAN A., *Extension Assistant Professor of Home Economics and Extension Nutritionist, Cooperative Extension Service*
B.Sc., Acadia University, 1953; M.S., Pennsylvania State University, 1955. (1960-)

UNIVERSITY OF NEW HAMPSHIRE

- PETERS, RUTH M., *Associate Professor of Mathematics*
B.A., Bryn Mawr College, 1928; M.A., *ibid.*, 1931; Ph.D., Radcliffe College, 1933. (1958-)
- †PETERSON, NOBEL K., *Associate Professor of Agronomy*
B.S., Kansas State College, 1948; M.S., Purdue University, 1950; Ph.D., Rutgers University, 1957. (1957-)
- PETTIBONE, MARIAN H., *Associate Professor of Zoology*
B.S., Linfield College, 1930; M.S., University of Oregon, 1932; Ph.D., University of Washington, 1947. (1953-)
- PILAR, FRANK L., *Assistant Professor of Chemistry*
B.S., University of Nebraska, 1951; M.S., *ibid.*, 1953; Ph.D., University of Cincinnati, 1957. (1957-)
- PLATT, JOHNSON T., *County 4-H Club Agent, Strafford County*
B.S., University of Connecticut, 1958. (1960-)
- †PLATTS, FRANCES E., *Associate Professor of Home Economics*
B.S., University of New Hampshire, 1933; M.Ed., *ibid.*, 1941. (1945-)
- POTTER, ALFRED R., *Instructor in The Arts*
B.F.A., Massachusetts School of Art, 1955; M.F.A., Cranbrook Academy of Art, 1960. (1960-)
- †PRINCE, ALLAN B., *Professor of Agronomy*
B.S., Rutgers University, 1947; Ph.D., *ibid.*, 1950. (1954-)
- PRITCHARD, HUGH, *Reference Librarian*
B.A., University of Washington, 1939; M.A., University of North Carolina, 1942; M.S., Columbia University, 1950. (1954-)
- PROUGH, ELIZABETH A., *Assistant County Club Agent, Merrimack County*
B.S., Pennsylvania State University, 1958. (1960-)
- RAND, M. ELIZABETH, *Associate Professor of Home Economics*
A.B., Wheaton College, 1930; M.Ed., Boston University, 1946. (1948-)
- RASMUSSEN, EDWIN J., *Extension Professor of Horticulture*
B.S., University of Wisconsin, 1927; M.S., *ibid.*, 1929. (1929-36, 1947-)
- REED, JOHN F., *Vice President and Professor of Botany*
A.B., Dartmouth College, 1933; M.A., Duke University, 1935; Ph.D., *ibid.*, 1936. (1956-)
- REED, ROBERT C., *Assistant Reference Librarian*
B.A., Hartwick College, 1953. (1960-)
- RICCI, ROBERT W., *Instructor in Chemistry*
B.S., Boston College, 1956. (1959-)
- †RICH, AVERY E., *Professor of Botany*
B.S., University of Maine, 1937; M.S., *ibid.*, 1939; Ph.D., State College of Washington, 1950. (1941-43, 1950-)
- RICH, WAYNE S., *Club Agent, Merrimack County*
B.S., University of Maine, 1934. (1946-)

THE UNIVERSITY FACULTY

- †RICHARDS, MATHIAS C., *Associate Dean of the College of Agriculture and Professor of Botany*
B.S., Utah State Agricultural College, 1932; Ph.D., Cornell University, 1938. (1941-)
- RICHARDS, TUDOR, *Forester, Cheshire and Sullivan Counties*
A.B., Harvard College, 1934; B.S.F., University of Michigan, 1952. (1954-)
- RICHARDSON, EDYTHE T., *Professor of Zoology*
B.S., New Hampshire College, 1922; M.S., University of New Hampshire, 1924. (1922-)
- RICHARDSON, JOHN C., *Associate Professor of English*
A.B., Dartmouth College, 1941; M.A., Columbia University, 1942; Ph.D., Boston University, 1959. (1946-)
- RICHTER, MAURICE N., JR., *Assistant Professor of Sociology*
B.A., Bard College, 1952; M.A., University of Chicago, 1954. (1960-)
- †RINGROSE, RICHARD C., *Professor of Poultry Science*
B.S., Cornell University, 1932; Ph.D., *ibid.*, 1936 (1942-)
- ROBINSON, FREDERICK J., *Assistant Professor of Mathematics*
B.S., University of New Hampshire, 1949; M.A., *ibid.*, 1955. (1949-)
- ROGERS, OWEN M., *Assistant Professor of Horticulture*
B.V.A., University of Massachusetts, 1952; M.S., Cornell University, 1954; Ph.D., Pennsylvania State University, 1959. (1959-)
- ROPER, ELIZABETH R., *Club Agent, Carroll County*
B.A., University of New Hampshire, 1928. (1928-)
- ROSEN, SAM, *Associate Professor of Economics*
A.B., University of Wisconsin, 1942; A.M., Harvard University, 1948; Ph.D., *ibid.*, 1952. (1957-)
- ROSS, SHEPLEY L., *Associate Professor of Mathematics*
A.B., Boston University, 1949; A.M., *ibid.*, 1950; Ph.D., *ibid.*, 1953. (1955-)
- †ROUTLEY, DOUGLAS G., *Assistant Professor of Biochemistry*
B.A., Hamline University, 1923; M.S., Pennsylvania State University, 1953; Ph.D., *ibid.*, 1957. (1957-)
- RUTHERFORD, RICHARD R., *Agricultural Agent, Grafton County*
B.S., University of New Hampshire, 1940. (1941, 1948-)
- SACKETT, EVERETT B., *Professor of Education*
B.A., Hamline University, 1923; M.A., University of Minnesota, 1925; Ph.D., Columbia University, 1931. (1938-)
- SAND, JANEEN L., *Instructor in Physical Education for Women*
B.S.P.E., The Woman's College of The University of North Carolina, 1959. (1959-)
- SARGENT, JOHN E., *Forester, Coos County*
B.S., University of New Hampshire, 1959. (1960-)
- SARGENT, LESLIE B., JR., *Forester, Grafton County*
B. S., University of New Hampshire, 1943. (1954-)

UNIVERSITY OF NEW HAMPSHIRE

- SAWYER, ALBERT K., *Assistant Professor of Chemistry*
A.B., Colby College, 1940; M.S., University of Maine, 1947. (1949-)
- SAWYER, PHILIP J., *Associate Professor of Zoology*
B.S., University of New Hampshire, 1940; M.S., *ibid.*, 1948; Ph.D., University of Michigan, 1956. (1952-)
- SCHAEFER, PAUL E., *Registrar*
A.B., Bethany College, 1926; M.S., Ohio State University, 1931; Ph.D., *ibid.*, 1936. (1941-)
- SCHNEER, CECIL J., *Associate Professor of Geology*
A.B., Harvard University, 1943; A.M., *ibid.*, 1949; Ph.D., Cornell University, 1954. (1949, 1954-)
- SCHREIBER, RICHARD W., *Assistant Professor of Botany*
B.S., University of New Hampshire, 1951; M.S., *ibid.*, 1952; Ph.D., University of Wisconsin, 1955. (1957-)
- SCHULTZ, J. HOWARD, *Professor of English*
B.A., University of Texas, 1933; M.A., *ibid.*, 1934; M.A., Harvard University, 1939; Ph.D., *ibid.*, 1940. (1946-)
- SEIBERLICH, JOSEPH, *Research Professor, Engineering Experiment Station*
Diploma Ingenieur, Technical University, Karlsruhe, Germany, 1924; Doctor Ingenieur, *ibid.*, 1928. (1941-)
- SHANKEN, EDWARD D., *Assistant Director of University Extension and Extension Instructor in Speech*
B.A., Pennsylvania State University, 1952; M.A., *ibid.*, 1953. (1954-)
- †SHIMER, STANLEY R., *Professor of Biochemistry*
B.S., Muhlenberg College, 1918; M.S., Pennsylvania State College, 1923. (1924-)
- SKELTON, RUSSELL R., *Professor of Civil Engineering*
B.S., Purdue University, 1924; C.E., *ibid.*, 1934; S.M., Harvard University, 1939. (1928-)
- †SKOGLUND, WINTHROP C., *Professor of Poultry Science*
B.S., University of New Hampshire, 1938; M.S., Pennsylvania State College, 1940; Ph.D., Pennsylvania State University, 1958. (1950-)
- †SLANETZ, LAWRENCE W., *Professor of Bacteriology*
B.S., Connecticut State College, 1929; Ph.D., Yale University, 1932. (1932-)
- SLOAN, ROGER P., *Forester, Rockingham County*
B.S., University of New Hampshire, 1942; M.P.A., Harvard University, 1960. (1946-)
- †SMITH, ANNA M., *Professor of Home Economics*
B.S., Pennsylvania State College, 1933; M.A., Teachers College, Columbia University, 1939; Ph.D., Pennsylvania State College, 1950. (1952-)
- *†SMITH, GERALD L., *Associate Professor of Animal Science*
B.S., University of New Hampshire, 1948; M.S., Pennsylvania State College, 1951. (1948-)

THE UNIVERSITY FACULTY

- †SMITH, SAMUEL C., *Assistant Professor of Poultry Science and Microbiologist*
B.S., Pennsylvania State University, 1955; M.S., *ibid.*, 1958; Ph.D., *ibid.*, 1961. (1961-)
- *†SMITH, WILLIAM W., *Professor of Horticulture*
B.S., University of New Hampshire, 1924; M.S., *ibid.*, 1929; Ph.D., Michigan State College, 1935. (1936-)
- SNIVELY, A. BARR, JR., *Assistant Professor of Physical Education and Athletics for Men*
B.S., Princeton University, 1923; M.A., Columbia University, 1941. (1953-)
- SOLT, MARVIN R., *Professor of Mathematics*
B.S., Lehigh University, 1918; M.S., *ibid.*, 1925. (1926-)
- SOUKARIS, PAULINE, *Instructor in Sociology, Part-time*
B.S., University of New Hampshire, 1950; M.S. in S.S., Boston University School of Social Work, 1959. (1959-)
- SPILLER, ROBERT L., JR., *Major, Assistant Professor of Air Science*
B.A., University of Massachusetts, 1949. (1958-)
- STABLER, JOSEPH P., *Lieutenant Colonel, Professor of Military Science*
B.S., U. S. Military Academy, 1943; M.A., University of Virginia, 1949; Graduate, Command and General Staff College, 1958. (1960-)
- STEARNS, JOSEPHINE S., *Assistant County 4-H Club Agent, Hillsborough County*
B.S., University of New Hampshire, 1958. (1960-)
- STEELE, DONALD E., *Professor of Music*
B.M., New England Conservatory of Music, 1946; M.A., Colorado College, 1952. (1946-)
- †STEVENS, CLARK L., *Professor of Forestry*
B.S., New Hampshire College, 1917; M.F., Yale University, 1926; Ph.D., *ibid.*, 1930. (1919-)
- STEVENS, ROBERT A., *Assistant State Club Leader, Cooperative Extension Service*
B.S., University of New Hampshire, 1937. (1955-)
- STEWART, GLENN W., *Associate Professor of Geology*
B.S., University of New Hampshire, 1935; M.S., Syracuse University, 1937. (1938-39, 1941-)
- STILES, DWIGHT G., *Agricultural Agent, Coos County*
B.S., University of New Hampshire, 1942. (1958-)
- STIMSON, RUTH G., *Home Demonstration Agent, Rockingham County*
B.S., University of New Hampshire, 1940; M.Ed., *ibid.*, 1944. (1942-)
- STOCKING, MARION I., *Home Demonstration Agent, Carroll County*
B.S., Simmons College, 1949. (1958-)
- STOLWORTHY, E. HOWARD, *Professor of Mechanical Engineering*
B.S., Tufts College, 1922. (1922-)

UNIVERSITY OF NEW HAMPSHIRE

- STONE, JOAN T., *Assistant Professor of Physical Education for Women*
B.S., Trenton State College, 1948; M.A., Montclair State Teachers College, 1955. (1954-)
- *†STROUT, RICHARD G., *Instructor in Poultry Science*
B.S., University of Maine, 1950; M.S., University of New Hampshire 1954. (1954-)
- †SWAIN, LEWIS C., *Professor of Forestry*
B.S., New Hampshire College, 1918; M.F., Harvard University, 1929. (1927-)
- SWAN, EMERY F., *Associate Professor of Zoology*
B.S., Bates College, 1938; Ph.D., University of California, 1942. (1952-)
- SWASEY, HENRY C., *Associate Professor of Physical Education and Athletics for Men*
B.S., Amherst College, 1915; M.S., Indiana University 1941. (1921-)
- SWEET, PAUL C., *Professor of Physical Education and Athletics for Men*
B.S., University of Illinois, 1923; M.A., University of Southern California, 1941. (1924-)
- SZYMUKO, JOSEPH A., *Assistant Forester, Cheshire and Sullivan Counties*
B.S., University of New Hampshire, 1954. (1958-)
- †TAYLOR, JOHN A., *Instructor in English*
B.A., Missouri University, 1952; M.A., State University of Iowa, 1957; Ph.D., *ibid.*, 1959. (1959-)
- TEACHOUT, ROGER S., *Major, Assistant Professor of Air Science*
B.A., Syracuse University, 1948; M.A., *ibid.*, 1953. (1958-)
- †TEERI, ARTHUR E., *Professor of Biochemistry*
B.S., University of New Hampshire, 1937; M.S., *ibid.*, 1940; Ph.D., Rutgers University, 1943. (1938-40, 1943-)
- THAMES, SARAH, *Associate Professor of Home Economics and Manager and Dietitian, University Dining Hall*
B.S., Simmons College, 1930; M.A., Teachers College, Columbia University, 1942. (1945-)
- THEOKRITOFF, GEORGE, *Assistant Professor of Geology*
Int. B.Sc., Chelsea Polytechnic, 1942; A.R.C.S., B.Sc., Royal College of Science, 1945; M.Sc., *ibid.*, (1960-)
- THOMAS, GEORGE R., *Professor of The Arts*
B.Arch., Carnegie Institute of Technology, 1930. (1930-)
- THOMPSON, WILBUR E., *Forester, Merrimack County*
B.S., University of New Hampshire, 1927. (1945-)
- TIRRELL, LORING V., *Professor of Animal Science*
B.S., Massachusetts Agricultural College, 1920; M.S., Massachusetts State College, 1941. (1921-25, 1930-)
- TOUBBEH, JAMIL I., *Instructor in Speech*
B.A., Millikin University, 1954; M.A., University of Illinois, 1956. (1959-)
- TOWLE, CARROLL S., *Professor of English*
A.B., Bowdoin College, 1922; Ph.D., Yale University, 1933. (1931-)

THE UNIVERSITY FACULTY

- TRAINOR, JAMES H., *Instructor in Physics*
B.S., University of New Hampshire, 1958; M.S., *ibid.*, 1959. (1959-)
- TURNER, HARRY J., *Lecturer in Zoology*
B.A., Yale College, 1935; M.S., Yale University, 1942. (1956-)
- TURNQUIST, HARRIET CLARK, *Home Demonstration Agent, Belknap County*
B.S., Framingham State Teachers College, 1942. (1946-)
- TYRRELL, DORIS E., *Associate Professor of Secretarial Studies*
B.S., University of Minnesota, 1926; M.A., *ibid.*, 1932. (1938-)
- UNDERWOOD, DALE S., *Associate Professor of English*
B.A., University of Kansas, 1937; M.S., Yale University, 1947; Ph.D., *ibid.*, 1952. (1958-)
- UNDERWOOD, RUSSELL E., *Extension Associate Economist in Marketing*
B.S., Pennsylvania State College, 1918. (1948-)
- UPHAM, EDWARD F., *Agricultural Agent, Rockingham County*
B.S., University of Massachusetts, 1953; M.S., *ibid.*, 1954. (1960-)
- VALENTINE, RUSSELL L., *Associate Professor of Mechanical Engineering*
Certificate in Machine Design, Wentworth Institute, 1942; B.S., Michigan State College, 1951; M.S.M.E., Purdue University, 1953. (1953-)
- VALENZA, DANIEL L., *Instructor in The Arts*
A.A.S., School for American Craftsmen at Rochester Institute of Technology, 1956; B.F.A., *ibid.*, 1958. (1959-)
- † WALLACE, OLIVER P., *Associate Professor of Forestry*
B.S., University of New Hampshire, 1937; B.S.F., University of Michigan, 1938; M.F., *ibid.*, 1947; Ph.D., *ibid.*, 1954. (1953-)
- WALLACE, WILLIAM H., *Assistant Professor of Geography*
B.S., Beloit College, 1948; M.S., University of Wisconsin, 1950; Ph.D., *ibid.*, 1956. (1957-)
- WALSH, JOHN S., *Professor of Languages*
A.B., Harvard University, 1915; M.A., Boston University, 1928. (1922-)
- WARREN, RICHARD, *Extension Professor of Poultry Science*
B.S., Cornell University, 1934; M.S., *ibid.*, 1935. (1937-)
- WEBBER, LAURANCE E., *Research Associate Professor and Associate Director, Engineering Experiment Station*
B.S., University of New Hampshire, 1934; M.E., *ibid.*, 1940; M.S., *ibid.*, 1946. (1937-)
- WEBSTER, KARL S., *Assistant Professor of Mechanical Engineering*
B.S., University of Vermont, 1949; M.S., Pennsylvania State University, 1958. (1958-)
- WEBSTER, ROBERT G., *Professor of English*
B.A., University of New Hampshire, 1926; M. A., *ibid.*, 1930. (1927-)
- * WEEKS, SILAS B., *Associate Professor of Agricultural Economics*
B.S., Cornell University, 1937. (1954-)
- WESTON, RUTH C., *Associate State Club Leader, Cooperative Extension Service*
B.A., New Hampshire College, 1921; M.Ed., University of Maryland, 1953. (1929-)

UNIVERSITY OF NEW HAMPSHIRE

- WHEELER, CHARLES M., JR., *Associate Professor of Chemistry*
B.S., West Virginia University, 1947; M.S., *ibid.*, 1949; Ph.D., *ibid.*, 1951. (1950-)
- WHITLOCK, JOHN B., *Associate Professor of Music*
B.Ed., Southern Illinois State Normal, 1937; M.A., State University of Iowa, 1941; Ph.D., *ibid.*, 1958. (1958-)
- WICKS, JOHN D., *Assistant Professor of Music*
A.B., Harvard University, 1944; A.M., *ibid.*, 1947; Ph.D., *ibid.*, 1959. (1956-)
- WILLIAMS, THOMAS A., JR., *Instructor in English*
B.A., University of New Hampshire, 1950; M.A., *ibid.*, 1958. (1958-)
- WILLIAMSON, PHYLLIS D., *Instructor in Speech*
B.A., Louisiana State University, 1945; M.A., *ibid.*, 1953. (1957-)
- WILLS, DOROTHY S., *Assistant Professor of Home Economics*
B.Sc., Drexel Institute of Technology, 1953; M.Sc., *ibid.*, 1955. (1958-)
- WILSON, JOHN A., *Instructor in Mechanical Engineering*
B.S. in M.E., Tufts University, 1958; M.S. in M.E., Northeastern University, 1960. (1960-)
- WINGERSKY, BARY G., *Instructor in Mathematics*
A.B., Tufts University, 1942. (1960-)
- WINN, ALDEN L., *Professor of Electrical Engineering*
B.S., University of New Hampshire, 1937; S.M., Massachusetts Institute of Technology, 1948. (1948-)
- WITT, WARREN W., *Major, Assistant Professor of Military Science*
B.S., Oklahoma State University, 1947. (1959-)
- WOOD, RANDOLPH L., *Colonel, Professor of Air Science*
B.S., University of Richmond, Va., 1929. (1959-)
- WOODRUFF, RUTH J., *Professor of Economics*
A.B., Bryn Mawr, 1919; A.M., *ibid.*, 1920; Ph.D., Radcliffe College, 1931. (1931-)
- WOOSTER, CAROLINE S., *Associate Professor of Physical Education for Women*
Sargent School for Physical Education, 1926; B.S., University of New Hampshire, 1943. (1946-)
- WRIGHT, PAUL A., *Associate Professor of Zoology and Endocrinologist*
S.B., Bates College, 1941; A.M., Harvard University, 1942; Ph.D., *ibid.*, 1944. (1958-)
- ZEI, JOHN J., *Instructor in Music*
B.M., Lawrence Conservatory, 1953; M.M., University of Michigan, 1959. (1959-)
- ZIMMERMAN, OSWALD T., *Professor of Chemical Engineering*
B.S.E., University of Michigan, 1929; M.S.E., *ibid.*, 1931; Ph.D., *ibid.*, 1934. (1938-)
- ZOLLER, J. HAROLD, *Professor of Civil Engineering*
B.S.C.E., University of Wyoming, 1941; B.S.E.E., University of Illinois, 1945; Ph.D., University of Wisconsin, 1953. (1958-)

Methods of Admission

The University will admit properly prepared New Hampshire students who are graduates of high schools or academies in New Hampshire which are approved by the State Board of Education, or those who are graduates of other accredited preparatory schools.

The in-state applicant should have a scholastic record ranking in the upper two-fifths of the graduating class, be recommended and/or certified, have an appropriate college preparatory background, and attain adequate scores on the Scholastic Aptitude Test of the College Entrance Examination Board.

The number of out-of-state students admitted each year is limited. The selection of out-of-state candidates is made primarily on the basis of superior academic achievement in secondary schools. In addition, such traits as character, leadership, and initiative will be taken into account.

It is recommended that students obtain as strong as possible an academic preparation by taking a regular and full college preparatory program of at least sixteen units, including English, mathematics, a foreign language, a natural science, and a social science.

While sixteen or more units of college preparatory work are recommended, the University will accept twelve in college preparatory subjects, including at least three years of English, one of natural science, and one of social science. Students entering the *College of Agriculture* must present units in English, natural science, social science, and at least two units of college preparatory mathematics.

Students entering the *College of Liberal Arts* must present units in English, natural science, social science, at least two units in a single foreign language, and at least two units of college preparatory mathematics.

Students entering the *College of Technology*, or electing agricultural engineering, must offer the above-mentioned units in English and social studies, and, in addition, must offer at least three and one-half units of mathematics, including elementary and intermediate algebra, plane geometry, and trigonometry. Starting in September of 1962, students enrolling in the College of Technology must present units in chemistry and physics as well. It should be noted here that commercial arithmetic and shop mathematics are not classified as college-preparatory subjects.

Every candidate for admission claiming New Hampshire residence shall be required to complete a form which contains a statement to the effect that his parents are legally domiciled in the State of New Hampshire and have been on the checklist of the town or city of domicile for the entire past year.

Students admitted from foreign countries or states other than New Hampshire shall be deemed to be non-residents throughout their entire attendance at the University unless and until the parents shall have gained *bona fide* residence in New Hampshire and can be considered to be domiciled in New Hampshire.

University Fees and Expenses

The following paragraphs summarize some of the pertinent information about fees and expenses. Complete information may be found in the *General Information* 1961-1962 issue of the University Bulletin.

TUITION. Tuition for each semester is payable in advance. Three-fourths will be refunded to a student withdrawing during the first four days of a semester; one-half after four days and within thirty; and none thereafter.

The charge for tuition is \$380 per year for residents of New Hampshire and \$800 for non-residents.* Refundable deposits may be required to cover locker keys or loss or breakage in certain departments. A charge will be made for individual lessons in music, as noted in the description of Applied Music courses. A charge will be made for riding lessons, as noted in the section on Physical Education for Women and Animal Science.

Any student who registers for 8 credits or more per semester shall pay the full tuition. Any student, regardless of state of residence, registering for fewer than 8 credits shall pay \$17.50 per credit hour.

CHANGES IN RATES. The University reserves the right to adjust charges for such items as tuition, board, and room rent from time to time. Such changes will be held to a minimum and will be announced as far in advance as feasible.

DEPOSITS. A deposit of \$15 is required of each student to whom military equipment is issued. Every student participating in the program of Physical Education and Athletics for Men and Physical Education for Women is required to pay \$1 for locker and towel service.

ACTIVITY CHARGE. The activity tax must be paid by each undergraduate. It will be about \$10. Both graduate and undergraduate students must pay a \$12 Memorial Union assessment.

ROOMS. Students living in University residence halls are required to sign room contracts covering the entire year beginning in September and ending in June. Housing applications will be sent to the student at the time of official admittance to the University. Room assignments will not be made until a later date, usually in July and August. A ten dollar (\$10.00) room deposit must accompany each application for a room. This deposit will be forfeited if the applicant fails to pay room rent by a stipulated date or cancels after that date. Upon occupancy the deposit is held as a damage deposit.

Room rent is payable in advance. For those attending the first semester, one-half of the year's rent must be paid not later than August 15. Rent for those attending the second semester must be paid not later than the last business day before the start of classes. The room reservation or assignment will be cancelled if rent is not paid by the stipulated due date. No follow-up notice will be sent.

* As part of the regional cooperation program of the New England Board of Higher Education, many non-residents from certain states will be eligible for tuition at the in-state rate in selected curricula, as follows: in Occupational Therapy, sophomores, juniors, seniors from all New England; in Hotel Administration, juniors and seniors from Maine, Massachusetts, Rhode Island, and Vermont; in Art and Art-Education, juniors and seniors from Maine, Rhode Island, and Vermont; in Physical Education for Women, juniors and seniors from Rhode Island and Vermont. The student must apply to the Registrar for this reduced tuition.

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Rooms paid for and not occupied one day after registration day may be declared vacant and three-fourths of the room rent returned, unless the individual having the reservation makes a written request to the Manager of University Housing to hold the room until a later date. No room will be held for longer than 10 days after registration date.

An undergraduate woman student under 23 years of age is required to room in one of the women's residence halls or a sorority house, unless she is working for a room in a private home or living with her family.

The College of Agriculture

HARRY A. KEENER, *Dean*

M. C. RICHARDS, *Associate Dean*

DEPARTMENTS

AGRICULTURAL ECONOMICS
AGRICULTURAL EDUCATION
AGRICULTURAL ENGINEERING
AGRONOMY
ANIMAL SCIENCE
BIOCHEMISTRY
BOTANY

DAIRY SCIENCE
ENTOMOLOGY
FORESTRY
HOME ECONOMICS
HORTICULTURE
POULTRY SCIENCE

GENERAL INFORMATION

The objectives of the College of Agriculture are to give the student a fundamental education in the biological, physical, and social sciences and to provide specific technical training according to student interest in agriculture, agricultural engineering, forestry, or home economics.

Agriculture is much broader than the production of food and fiber. It includes, in addition to production, the processing, distributing, and marketing of agricultural products. These operations involve more than one-third of the total labor force in the United States and provide a wide range of career opportunities for adequately prepared college graduates. Governmental agencies, both advisory and regulatory, offer other career opportunities for graduates of agricultural colleges.

Many graduates of the College of Agriculture continue their education by studying for advanced degrees in order to prepare for the specialized positions available in teaching, research, extension, and industry. The program of study for a student who plans to enter graduate school should differ from that of a student who intends to accept a position immediately after completing the bachelor's degree. The college will help the student with his choice of a career and prepare him for competence and leadership in that career.

The College of Agriculture offers the following degrees: Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Engineering, Bachelor of Science in Forestry, and Bachelor of Science in Home Economics.

Upon entering the College of Agriculture a student will declare what degree he or she seeks. In each of these degree programs the following curricula are available:

1. BACHELOR OF SCIENCE IN AGRICULTURE
Agricultural Business and Marketing
Agricultural Science
Agricultural Technology
2. BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING
Agricultural Engineering
3. BACHELOR OF SCIENCE IN FORESTRY
Forestry
Forest Game Management

COLLEGE OF AGRICULTURE

4. BACHELOR OF SCIENCE IN HOME ECONOMICS

General Home Economics

Clothing and Textiles

Foods, Nutrition, and Institutional Management

Home Economics Education

The student may select his curriculum and area of specialization upon entering as a freshman or he may wait until registration for the sophomore year. If he does not make his decision upon entering the University, the Associate Dean of the College of Agriculture will act as his adviser during the freshman year. Upon choosing a curriculum the student will be assigned an adviser, a faculty member from the department most directly concerned. Should the student elect to change his curriculum or area of specialization a new adviser may be assigned.

Specialized programs of study, such as pre-theological and two-year pre-veterinary, can be arranged for students who desire them.

For the degree of Bachelor of Science in Agriculture, Forestry, or Home Economics, each candidate must complete 136 semester credits; for the degree of Bachelor of Science in Agricultural Engineering, each candidate must complete 144 semester credits.

BACHELOR OF SCIENCE IN AGRICULTURE

The following curricula are available for students seeking a Bachelor of Science degree in Agriculture:

Agricultural Business and Marketing

The Agricultural Business and Marketing curriculum provides for those interested in the business management and economic aspect of the agricultural industry. The general program is designed to provide basic training in specific areas of interest supplemented by training in business management and the economic aspects of agriculture. Recent trends toward larger agricultural organizations have created a demand for agricultural graduates trained in business and marketing.

Opportunities covering a variety of interests are available. One area includes the business management of processing plants, sales agencies, or agricultural cooperatives. Another area concerns the analysis and forecasting of prices for individual agricultural commodities. Other opportunities exist in federal and state regulatory agencies.

Because of the wide range of opportunities available in this field, programs for individual students will vary considerably. The student will be advised in both the area of interest he chooses and the business and economic aspect of his program.

Agricultural Science

The Agricultural Science curriculum is intended for the student interested in obtaining a strong background in the biological, physical, or social sciences. Such a background is highly desirable for the research scientist who is assuming an increasingly vital role in world agriculture. It is equally desirable for the teacher who is able to translate research information into terms intelligible to the production specialist.

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Career opportunities for agricultural scientists are many and varied. State and federal agencies, universities, and industries increasingly are sponsoring both basic and applied research. Educational institutions have a growing need for teachers trained in science.

Careers in research and teaching generally require graduate degrees. The agricultural science curriculum permits an area of specialization and insures the wide background in the basic sciences which is indispensable for graduate study.

Agricultural Technology

The Agricultural Technology curriculum is designed for the student desiring a comprehensive modern training in the production aspects of his particular area of specialization or a combination of related areas. Since the production phase of agriculture today involves large-scale organizations, some even with foreign operations, preparation for work in this area requires broad, general training with specialization in one or two areas.

This curriculum provides a good background in the biological and physical sciences and also in the humanities and social sciences. It is sufficiently flexible to permit choice of courses in such areas as agricultural credit and business, education, and foreign languages.

Many excellent opportunities are available in a variety of industries for students prepared under the agricultural technology curriculum. Included are such positions as farm managers, county 4-H and agricultural extension agents, production specialists, and vocational agricultural instructors. Positions are also available in management, research, selling, and service work in commercial organizations, and with state and federal agencies in grading, inspection, and regulatory work.

GENERAL REQUIREMENTS

The student will elect one of the following three curricula: Agricultural Business and Marketing, Agricultural Science, or Agricultural Technology. He will also choose an area of specialization from the following:

AGRICULTURAL ECONOMICS
AGRICULTURAL EDUCATION
AGRONOMY
ANIMAL SCIENCE
BIOCHEMISTRY
BOTANY

DAIRY SCIENCE
ENTOMOLOGY
HORTICULTURE
MECHANIZED AGRICULTURE
POULTRY SCIENCE
PRE-VETERINARY MEDICINE

In order to qualify for a degree each candidate must accumulate 136 semester credits, including credits for courses prescribed by his adviser. He must also achieve a grade point average of at least 1.8.

No student may graduate from the College of Agriculture without a specific recommendation from his adviser or advisory committee.

COLLEGE OF AGRICULTURE

SPECIFIC REQUIREMENTS

During the freshman year nearly all students who are candidates for the degree of Bachelor of Science in Agriculture will pursue the same general outline of course work as listed below:

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
R.O.T.C.	1½	1½
Physical Education 31, 32	½	½
Agriculture 1	1	
Botany 1	4	
Chemistry 1, 2 or 3, 4	4	4
Elective	3	6
English 1, 2	3	3
Zoology 48		3
	17	18

In addition, students must take the following 21 credits of course work: Sophomore R.O.T.C., men only (3 credits), Economics 1 (3 credits), Physics (4 credits), English and/or Speech (5 credits), Mathematics (6 credits).*

ADDITIONAL REQUIREMENTS

In order to complete the requirements for the Bachelor of Science degree in Agriculture, a student must obtain, in addition to the specific requirements, credits in the following groups:

- Group A — Arts, English, Language, Music, Philosophy, Speech
- Group B — Bacteriology, Botany, Entomology, Zoology
- Group C — Biochemistry, Chemistry, Mathematics, Physics, Statistics
- Group D — Economics or Agricultural Economics, Education, Government, History, Psychology, Sociology
- Group E — Courses in the College of Agriculture
- Group F — Courses which adviser considers necessary for specialized study in area of interest
- Group G — Elective courses which the student considers appropriate to meet his educational objectives

The group requirements for each curriculum are as follows:

Agricultural Business and Marketing

- Group A—6 credits
- Group C—3 credits
- Group D—9 credits selected from at least 3 of the subject areas listed;
Also 9 credits in Economics 2 and Business Administration 1, 2

* It is assumed that many students will select mathematics as an elective during the freshman year.

UNIVERSITY OF NEW HAMPSHIRE

Group E—9 credits selected from at least 3 subject areas other than his area of specialization

Group F—30 credits

Group G—23 credits*

47 credits specific requirements

136 credits

Agricultural Science

Group A—9 credits

Group B—6 credits

Group C—9 credits selected from at least 2 of the subject areas listed

Group D—9 credits selected from at least 2 of the subject areas listed

Group E—3 credits in a subject area other than his area of specialization

Group F—30 credits

Group G—23 credits*

47 credits specific requirements

136 credits

Agricultural Technology

Group A—6 credits

Group B—3 credits

Group C—6 credits selected from at least 2 of the subjects listed

Group D—9 credits selected from at least 3 of the subjects listed

Group E—12 credits selected from at least 3 subject areas other than his area of specialization

Group F—30 credits

Group G—23 credits*

47 credits specific requirements

136 credits

The above curricula offer a student considerable flexibility depending upon his interest and objectives.

AREAS OF SPECIALIZATION

AGRICULTURAL ECONOMICS

AGRICULTURAL EDUCATION

AGRONOMY

ANIMAL SCIENCE

BIOCHEMISTRY

BOTANY

DAIRY SCIENCE

ENTOMOLOGY

HORTICULTURE

MECHANIZED AGRICULTURE

POULTRY SCIENCE

PRE-VETERINARY

* Depending upon the specific courses chosen by the student in groups A through E, there may remain somewhat fewer than 23 credits in Group G.

COLLEGE OF AGRICULTURE

Agricultural Economics

The student in Agricultural Economics learns primarily the science of economics and the application of economics to farm management, food marketing, agricultural price policy, use and conservation of natural resources, world food supply, and growth in underdeveloped countries. In addition, students majoring in this field will obtain a sound background in scientific farming from courses in agricultural production. The student is also encouraged to take courses contributing to a broad university education.

Course work in Agricultural Economics can be arranged under either of the three curricula for the degree of Bachelor of Science in Agriculture:

1. *Agricultural Business and Marketing*: The agricultural producer is being served by an expanding group of marketing and service firms requiring agricultural college graduates with economics and business training. In Agricultural Economics the program emphasizes marketing and market development, agricultural business management, consumer economics, price analysis, and farmer cooperation, with supplementary courses in accounting.
2. *Agricultural Science*: This curriculum is designed for students interested in college teaching, scientific research, and careers in specialized fields requiring strong backgrounds in the economics of agriculture. Some of the specialized fields are foreign service in underdeveloped countries, market development and price analysis, agricultural banking, and resource conservation. Emphasis is placed upon the basic concepts and theories of economics and their application to agriculture and marketing. This curriculum also will be advantageous for the student planning to pursue graduate study.
3. *Agricultural Technology*: Students in this curriculum who choose Agricultural Economics as their special area of interest will be preparing for careers associated with the broad economic aspects of agricultural production and marketing. This program of study will prepare the student as a farm owner or manager. In addition he will be qualified to fill numerous available positions with such organizations as the agricultural extension service, banks, farmers' cooperatives, market regulating organizations, and firms selling farm supplies or farm products. The student will take specific courses in production economics, marketing, agricultural policy, farm credit, and agricultural cooperatives.

The courses in Agricultural Economics are complementary with those offered by other departments in the College and are in part designed to help major students in other fields gain knowledge about economics related to agriculture.

Agricultural Education

Under the provision of the Smith-Hughes Act, the University of New Hampshire has been designated as the institution in this state for the preparation of teachers of agriculture. Vocational Agriculture offers a fertile field for young men who desire to follow the profession of teaching. The work is varied and interesting with opportunities for wide community contacts through the all-day, young-farmer, and adult-farmer programs.

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Agricultural teachers are encouraged to enter upon a program of graduate study as a means of professional growth. Successful completion of such study should result in greater opportunities for advancement in the field of agricultural education.

Due to the nature of the duties performed by the teacher of agriculture, it is essential for a student to acquire a good foundation in the predominating agricultural enterprises of the state. His course of study, therefore, will follow a broad general program rather than a specialization in any one particular field. Furthermore, he must meet the state requirements for certification which include one semester of practice teaching, 14 additional credits of courses in Education, and 8 credits in Agricultural Engineering. In addition, the teacher must have farm upbringing prior to enrolling in Vocational Agriculture Teacher Training or two years of agricultural experience, one year of which must have been continuous in a standard commercial farm enterprise.

Agronomy

Students specializing in Agronomy obtain a basic knowledge of the physical and biological sciences in addition to learning the fundamental principles in soils, field crops, plant breeding, and plant genetics. Basic training in the soils and crop sciences is essential to most segments of agriculture.

Those students who specialize in soils may find employment in soil conservation, soil classification and mapping, soil fertility, soil physics, soil chemistry, soil microbiology, and many other fields requiring a knowledge of the soil. Those who specialize in crops will be qualified for employment in crop production, plant breeding, turf management, weed control, crop introduction, and in related fields.

Persons trained in Agronomy are qualified to take Federal Civil Service examinations to enter field crops, soil science, or soil conservation positions in the United States Department of Agriculture. Positions in research and teaching are also available to those with advanced training at the graduate level. The agricultural extension services, as well as seed, feed, and fertilizer companies, employ graduates who have training in Agronomy.

Well-equipped laboratories and greenhouse facilities are provided for students. Opportunities are available to study nearby field experiments.

Animal Science

Animal Science is offered to students who wish training in the selection, breeding, feeding, fitting, showing, training, and management of light horses, beef cattle, sheep, and swine. It provides basic knowledge for all livestock enterprises and related fields, including conservation and the packing and feed industries.

Many graduates enter the field of extension work as county agents and livestock specialists. The subject matter is fundamental for advanced study in Animal Science. Some who have completed this curriculum are executives, managers, veterinarians, college teachers, breed representatives, packer buyers, feed salesmen, and farm operators.

Students are assigned advisers in the Animal Science Department. The adviser will discuss the areas of the individual's special interest and recommend a choice of Agricultural Science, Agricultural Business and Marketing, or Agricultural Technology as a guide in course selection.

COLLEGE OF AGRICULTURE

Meat and meat products are included in this curriculum. Cultural subjects are required. Students interested in certain classes of livestock may have opportunities to specialize.

The department maintains Morgan horses for all phases of class work including riding. Selected students may be permitted to take young horses to their homes in the summer for continued training. Herds of Milking Shorthorn, Hereford, and Aberdeen Angus cattle, Yorkshire swine, and a flock of Dorset sheep are maintained.

Biochemistry

Students choosing Biochemistry as their area of specialization will elect the Agricultural Science curriculum. They will receive training in the various branches of general chemistry and in the application of chemistry to the growth and development of plants and animals. The methods used in biochemical analysis and in the study of nutrition and metabolism are given special attention.

The curriculum is designed to provide a thorough foundation for students preparing for graduate study and eventual teaching or research, or for technical positions in universities, experiment stations, research institutes, and industrial organizations related to the life sciences. A freshman who wishes to major in this department should take Chemistry 3-4 and also Mathematics 21-22, if his high school preparation is adequate.

As this is a professional and specialized field, entrance to it, and continuance in it, are conditioned by a satisfactory record. An early conference with the chairman of the department is imperative.

Botany

Students interested in a broad background in the plant sciences should consider majoring in Botany. Such students will generally choose the Agricultural Science curriculum.

The principal areas of concentration in Botany are: (1) Plant Pathology—the study of plant diseases, their causes and control; (2) Physiology—the study of plant functioning with such practical applications as plant nutrition and requirements for plant growth; (3) Taxonomy—plant classification and plant identification; (4) Ecology—the relationship of the plant to its environment; (5) Morphology and Anatomy—the study of the anatomy, development, and cellular organization of plants, including histological techniques; (6) Cytology—the cell, cytological techniques, and chromosome studies; (7) Preparation for botanical technicians; and (8) Preparation for secondary-school teaching.

The undergraduate courses to be taken in all these fields are nearly the same until the junior and senior years. Some specialization should then be made. The student who graduates in Botany may take graduate work in Botany or in the related fields of Horticulture, Forestry, and Agronomy which require an extensive background in Botany. Assistantships, research positions, and full-time teaching jobs are more available at present than in previous years. Opportunities for able botanists also occur in government work. Positions as technicians or secondary-school teachers may be obtained with a B.A. or B.S. degree.

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Dairy Science

Dairy Science courses are designed to provide fundamental scientific training in dairy production and dairy technology.

Outstanding graduates from both of these areas are qualified to pursue advanced study in preparation for college teaching, research, and specialized technical positions in industry, agricultural experiment stations, and federal and state agencies.

Dairy production courses include breeding, nutrition, and management of dairy cattle. They offer preparation for the various agricultural industries and services related to dairy farm operations, such as technical positions in the food industry, the dairy equipment industry, and breed and breeding organizations; positions in public service with state and federal agencies; and dairy farm management.

Training in dairy technology prepares students for administrative and plant and laboratory positions in dairy processing plants, and for inspectors of dairy products and dairy establishments in federal, state, and municipal service.

The University dairy herd, together with the operations in the market milk, pasteurizing, and ice cream units at the Dairy Building, contribute to the practical training of students in any one of several lines of the dairy industry.

The Dairy Science laboratories are located in the Dairy Building, in the Ritzman Animal Nutrition Laboratory, and in the Dairy Barn. Facilities in the area of dairy production include the University dairy herd, consisting of purebred Ayrshire, Guernsey, Holstein, and Jersey animals. This herd has received national recognition and honors.

Equipment in the Ritzman Animal Nutrition Laboratory includes a bomb calorimeter, metabolism stalls for digestion studies, respiration chambers for heat production measurements, and other facilities used in nutrition research with both farm and laboratory animals. Facilities for dairy technology, located in the Dairy Building, include pasteurizers, coolers, ice cream freezer, bottler, refrigeration units, homogenizer, and a soaker type bottle washer. The milk testing and bacteriological laboratories are equipped for chemical and bacteriological analyses of dairy products.

Entomology

Entomology offers courses for students who wish to specialize in the study of insect life, insect control, apiculture, and insects in relation to man. There are many fields open to those qualified in Entomology. There are opportunities for employment in public institutions and organizations, and in addition, there are many opportunities for employment with commercial and industrial firms.

Students who desire a broad fundamental training in Entomology and related fields will follow the program outlined as General Entomology in the Agricultural Technology curriculum. Those who wish to specialize in chemical control of insects, and who plan to take graduate work leading to a professional degree in that field, will follow a program outlined as Insect Toxicology in the Agricultural Science curriculum. These students will be expected to take considerable mathematics and chemistry.

Students planning a career in Entomology should consult with their adviser in regard to the selection of electives best suited to their needs.

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Horticulture

Conditions of climate, soil, and market combine to make New Hampshire a state with great horticultural possibilities. The Department of Horticulture offers instruction in three major fields: Pomology (fruit growing, including small fruits), Vegetable Crops, and Ornamental Horticulture, with particular emphasis on propagation and greenhouse management.

Students who graduate with an interest in Horticulture will have received the liberal training expected of a university graduate, a thorough preparation in the fundamental sciences underlying plant production and plant breeding, adequate training in general horticulture, and, finally, some specialization in the field chosen. The particular courses suggested by the adviser will be determined by the curriculum chosen by the student, i.e., Agricultural Business, Agricultural Science, or Agricultural Technology.

The courses offered acquaint the student with the problems and methods of the improvement, production, and marketing of fruits, vegetables, plants, or flowers. The training is such that superior students can pass the Federal Civil Service examinations required for entrance into positions with the United States Department of Agriculture. It is usually expected that students will take graduate work if they intend to make their professional career in research, teaching, or extension at the state or federal level. University of New Hampshire graduates with a good scholastic record have had no difficulty in securing fellowships or scholarships in other colleges and universities for graduate training.

When a student desires, a special effort is made to provide opportunity for practical experience during vacation periods so that upon graduation he has more than a theoretical knowledge of his profession. The extensive University orchards, gardens, and greenhouses are used as laboratories.

Mechanized Agriculture

Specialization in the area of Mechanized Agriculture is offered by the Department of Agricultural Engineering. This major is designed to provide instruction and training in the fundamentals of agricultural science with particular emphasis on the technical phases of farm operation. The program of study prepares men for self-employment as farm operators and for commercial positions in the agricultural industry.

Mechanized Agriculture majors may find employment selling or servicing agricultural building materials, labor-saving mechanical equipment, irrigation systems, tractors, and field machinery. Graduates are qualified for positions as agricultural extension workers, as soil conservationists with the Soil Conservation Service, or as "rural use advisers" with electric utility companies. They may also find employment with farm insurance companies or agricultural management organizations.

As farming becomes more intensive and the mechanization of our farms more complete, there will be even greater opportunities for men with this type of training.

Poultry Science

Poultry Science courses offer students fundamental and special training in the practical and professional fields of poultry. The poultry industry is one of the fastest growing agricultural industries and it offers excellent opportunities for trained personnel in all of its phases.

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The program of study prepares students for various lines of work, such as production, sales and service with feed and equipment manufacturing concerns, marketing organizations handling poultry and eggs, extension work, commercial hatcheries, geneticists with breeding organizations, nutritionists with feed concerns, market analysts with industrial concerns, poultry farm managers, as well as for the operation of the individual's own farm. By supplementing undergraduate work with one or more years of graduate study, properly qualified students will find excellent opportunities in the professional fields of teaching, extension, and research, and in commercial fields.

Major students will find a variety of courses offered in the Department. A student interested in Poultry Science should take a selected group of these courses with the others optional, depending upon his interests.

A qualified staff member of the Department assists the student in planning his course of study so as to give consideration to the interest and abilities of each student.

The student selecting Poultry Science as his area of specialization can obtain a well balanced program in any one of the three curricula; Agricultural Business and Marketing, Agricultural Science, or Agricultural Technology.

The Department works closely with the New Hampshire poultry industry which ranks high in the country. In this connection, frequent trips are made to leading farms and industrial concerns and full discussion is given in the classroom to broad and pertinent problems of the industry.

All the facilities of the University Poultry Farm and the research laboratories are available for instruction purposes.

Pre-Veterinary

Students who contemplate veterinary medicine as a career should elect the Agricultural Science Curriculum. During the freshman year the pre-veterinary student will choose the curriculum outlined for all agricultural freshmen, excepting that Chemistry 3 and 4 will be taken instead of Chemistry 1 and 2.

Because of the fact that the veterinary colleges of the country vary somewhat in their pre-veterinary requirements, it is necessary for each student to confer with his adviser relative to course work requirements of the sophomore year.

Although two years of pre-veterinary college work will meet the requirements of most schools of veterinary medicine, it is not to be regarded as a foregone conclusion that completion of such work will guarantee admission. All veterinary colleges give first preference for admission to applicants from their respective states. The few out-of-state students who will be admitted must show above average scholastic ability.

It is desirable that applicants to colleges of veterinary medicine have farm experience and, in fact, it is a prerequisite for admission to some.

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

The purpose of this curriculum is to train men in the application of engineering knowledge and techniques to the problems of the agricultural industry. A sound academic background in the natural sciences and mathe-

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matics and the fundamentals of engineering and agricultural precede specialization in Agricultural Engineering. Most agricultural engineers are employed in the fields of farm structures, farm machinery, electric power, crop processing, and soil and water conservation. The student has an opportunity to select courses which are of interest to him and are related to these major phases of the profession.

Students who elect this course of study are expected to prepare for engineering service in rural communities; for teaching, research, and extension work in colleges, experiment stations, and government agencies; for positions related to the design, manufacture, and sale of farm machinery and farm power equipment; for advisory and managerial posts in connection with agricultural development; for positions with farm buildings and materials concerns; and for work relating to the increased use of electricity in agriculture. Opportunities for employment and progressive advancement after graduation are numerous in this expanding field of engineering.

Each candidate for a degree in Agricultural Engineering must complete at least 144 semester credits of the courses required in the four-year curriculum described below.

FRESHMAN YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 31-32	$\frac{1}{2}$	$\frac{1}{2}$
M. S. 11-12, or A. S. 15-16	$1\frac{1}{2}$	$1\frac{1}{2}$
Agr. Eng. 15, <i>Agr. Eng. Shop</i>	1	
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
*Math. 21-22, <i>Calculus B1 and B2</i> , or Math. 25-26, <i>Calculus A1 and A2</i>	5	5
M. E. 13-14, <i>Engineering Drawing</i>	1	1
Phys. 18, <i>General Physics I</i>		4
Social Humanistic Elective	3	
	19	19

SOPHOMORE YEAR

M. S. 21-22, or A. S. 25-26	$1\frac{1}{2}$	$1\frac{1}{2}$
Econ. 1, <i>Principles of Economics</i>	3	
Agron. 11, <i>Introductory Soils</i>	4	
C. E. (7), <i>Surveying</i>		3
†Math. 23-24, <i>Calculus B3 and Differential Equations</i> , or Math. 27-24, <i>Multi-dimensional Calculus and Differential Equations</i>	5	3
M. E. 25, <i>Statics</i>	2	
M. E. 26, <i>Dynamics</i>		3
Phys. 23-24, <i>General Physics II, III</i>	4	4
Social Humanistic Elective		3
	$19\frac{1}{2}$	$17\frac{1}{2}$

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 21-22-23 sequence will normally enroll in Math. 27 in lieu of a technical elective during the junior year.

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JUNIOR YEAR

Ag. Eng. 32, <i>Farm Tractors</i>		3
Ag. Eng. 33, <i>Field Machinery</i>	3	
E. E. 39, <i>Electrical Engineering Fundamentals</i>	4	
M.E. 33, <i>Thermodynamics</i>	3	
M. E. 35, <i>Strength of Materials</i>	3	
Agricultural Electives		6
Technical Electives	6	9
	19	18

SENIOR YEAR

Ag. Econ. 14, <i>Farm Management</i>		4
Ag. Eng. 31, <i>Soil and Water Engineering</i>	3	
Ag. Eng. 34, <i>Agricultural Structures</i>		3
Ag. Eng. 35, <i>Rural Electrification</i>	3	
Ag. Eng. 41, 42, <i>Special Problems in Agricultural Engineering</i>	1—3	1—3
C.E. 52, <i>Fluid Mechanics</i>		3
Engl. 23, <i>Writing of Technical Reports</i>	2	
Technical Electives	6—8	6—8
	18	18

BACHELOR OF SCIENCE IN FORESTRY

Forestry majors are educated in professional responsibility and for employment as foresters in public and private organizations in all forest regions of the United States. All students will have completed the same foundation in the basic sciences in addition to a group of required Forestry courses upon receiving the degree of Bachelor of Science in Forestry. The curriculum is designed to prepare men for the work required of foresters, from the growing of raw material to its utilization by forest industries. The responsibilities and skills of the profession also include the management of non-agricultural lands for watershed, wildlife, and recreational values. The Department of Forestry is accredited by the Society of American Foresters.

The courses in the Forestry curriculum are required and intended to assure the student a sound professional base. Beyond this the student and his forestry adviser develop a program of study on an elective basis, not only from courses available in the Forestry Department but throughout the University, dependent upon the individual's needs and professional goals. Immediately following the junior year, all forestry students attend an eight weeks' summer camp in the White Mountains. The student also gains the advantages of field instruction on 575 acres of woodlands adjacent to the University campus under management of the Forestry Department. The student forester is expected to complete one or more summers of successful employment in forestry during his undergraduate years. Close liaison is maintained between the employing agencies and the Department on the work progress of the student.

The Department has developed a specialized program over the years for those who specifically wish to fit themselves for employment in wildlife

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management. These men are required to complete the same basic program as other Forestry students. This combination is considered essential, as a large part of the country's wildlife program of the future will be handled by men employed primarily as foresters.

Candidates for the Bachelor of Science degree in Forestry must complete 136 semester credits, including the departmental course requirements, the freshman year courses, and the additional requirements of the College of Agriculture. These requirements are listed on page 55 and are met by completing one of the Forestry curricula as outlined.

FORESTRY

FRESHMAN YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 31-32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Agr. 1, <i>Orientation</i>	1	
Bot. 1, 6, <i>General Botany, Systematic Botany</i>	4	3
Chem. 1, 2, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
For. 25, <i>Dendrology</i>	2	
Mathematics		3
Zool. 48, <i>Principles of Zoology</i>		3
	16	18

SOPHOMORE YEAR

R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Agron. 11, <i>Introductory Soils</i>	4	
Bio. Ch. 1, <i>Organic and Biological Chemistry</i>	5	
C. E. (7), <i>Surveying</i>		3
Econ. (1), <i>Principles of Economics</i>		3
Ent. 46, <i>Forest Entomology</i>		3
For. 27, <i>Silvics</i>	3	
For. 28, <i>Applied Statistics</i>		3
Mathematics	3	
Sp. (15), <i>Public Speaking</i>		3
	$16\frac{1}{2}$	$16\frac{1}{2}$

JUNIOR YEAR

Bot. 56, <i>Plant Physiology</i>		4
Engl. (23), <i>Writing of Technical Reports</i>		2
For. 29, <i>Silviculture</i>	3	
For. 43, 44, <i>Forest Mensuration; Forest Economics</i> ..	4	3
Physics 9, <i>Elementary Physics</i>	4	
Social Science	3	3
Electives	4	4
	18	16

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SUMMER SESSION

For. 42, <i>Forest Engineering</i>	4	
For. 45, <i>Timber Survey</i>	6	
	10	

SENIOR YEAR

For. 51, 66, <i>Forest Utilization; Wood Identification</i> ..	4	3
For. 59, (69), <i>Forest Protection; Forest Management</i>	3	4
Electives	5	13
	12	17

FOREST GAME MANAGEMENT

FRESHMAN YEAR

Same as for Forestry

SOPHOMORE YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
R.O.T.C.	1½	1½
Bio. Ch. 1, <i>Organic and Biological Chemistry</i>	5	
C. E. (7), <i>Surveying</i>		3
Econ. (1), <i>Principles of Economics</i>		3
Ent. 46, <i>Forest Entomology</i>		3
For. 27, <i>Silvics</i>	3	
For. 28, <i>Applied Statistics</i>		3
Mathematics	3	
Zool. 7, 8, <i>General Zoology; Comparative Anatomy</i> ..	5	5
	17½	18½

JUNIOR YEAR

Bot. 56, <i>Plant Physiology</i>		4
Engl. (23), <i>Writing of Technical Reports</i>		2
For. 29, 34, <i>Silviculture; Forest Fish and Game</i>	3	3
For. 43, 44, <i>Forest Mensuration; Forest Economics</i> ..	4	3
Phys. 9, <i>Elementary Physics</i>	4	
Zool. 77, 78, <i>Natural History and Taxonomy of the Vertebrates</i>	5	5
	16	17

SUMMER SESSION

For. 41, <i>Wildlife Field Studies</i>	10
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SENIOR YEAR

Agron. 11, <i>Introductory Soils</i>	4	
For. 51, 66, <i>Forest Utilization; Wood Identification</i> ..	4	3
For. 59, (69), <i>Forest Protection; Forest Management</i>	3	4
For. 55, 56, <i>Forest Game Management</i>	4	4
Social Science	3	3
Sp. (15), <i>Public Speaking</i>		3
	18	17

COLLEGE REQUIREMENTS FOR FORESTRY MAJORS

Freshman year: R.O.T.C.; Physical Education 31, 32; Agriculture 1; Botany 1; Chemistry 1, 2 or 3, 4; English 1, 2; and Zoology 48.

Additional requirements: Sophomore R.O.T.C.; Biological Science (3 credits in Bacteriology, Botany, Zoology, or Entomology); Biochemistry or Chemistry (5 credits); Economics 1 (3 credits); Economics, Agricultural Economics, or Forestry 44 (3 credits); English and/or Speech (5 credits); Mathematics (3 credits); Physics (4 credits); Social Sciences (6 credits) in Government, History, Psychology, Sociology, or Education 41 or 57.

BACHELOR OF SCIENCE IN HOME ECONOMICS

There are four majors offered in Home Economics, all leading to a Bachelor of Science degree in Home Economics:

1. **GENERAL HOME ECONOMICS.** By a careful selection of elective courses, students are prepared for one of several positions. They may be employed in home service departments of gas and electric companies, in department stores, nursery schools, welfare agencies, as food editors with newspapers, in radio, in television, and with the Cooperative Extension Service.

2. **CLOTHING AND TEXTILES.** Positions are available in textile analysis, merchandising, retailing, and promotional work with pattern companies and manufacturers. Interior design and fashion illustration are careers for the student with a talent in art. Additional graduate education leads to teaching or research in college or work as a clothing specialist with the Cooperative Extension Service.

3. **FOODS, NUTRITION, AND INSTITUTIONAL ADMINISTRATION.** In this major there are many career choices for those who qualify: as hospital dietitians, in college and industrial food services, in school lunch programs, with food and equipment companies, with newspapers, radio, television, advertising agencies, or with public and private health services. With additional preparation the home economist does research in foods and nutrition in industry, with the government, or in universities.

4. **HOME ECONOMICS EDUCATION.** Home economists teach in elementary and high schools and are employed by the Cooperative Extension Service. Majors with teaching experience and graduate study find

UNIVERSITY OF NEW HAMPSHIRE

positions in the specialized fields of adult education, college teaching, or administration.

A student majoring in any one of the above is required to meet the specific and additional minimum requirements of the College of Agriculture, as follows:

SPECIFIC REQUIREMENTS

Except for Physical Education these requirements would usually be completed during the freshman year.

Agriculture 1
 Botany 1, Zoology 48, or Biology 1-2
 Chemistry 1, 2 or 3, 4
 English 1-2
 Physical Education 1, 2, 3, 4, 5, 6

ADDITIONAL MINIMUM REQUIREMENTS

These requirements are ordinarily completed during the sophomore, junior, or senior years.

Biological Sciences (Bacteriology, Botany, Zoology, Entomology 2, 41)	3
Chemistry (Biochemistry or Chemistry)	5
Economics 1	3
Economics or Agricultural Economics	3
English and/or Speech	5
Social Sciences (Government, History, Psychology, Sociology, Education 41, 57)	6

GENERAL HOME ECONOMICS

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 1, 2	1	1
Agr. 1, <i>Orientation</i>	1	
Arts 23, <i>Elementary Drawing and Design</i>	2	
Chem. 1-2, <i>General Chemistry</i>	4	4
English 1-2, <i>Freshman English</i>	3	3
H. E. 4, <i>Textiles</i>		4
H. E. 5, <i>Principles of Clothing Construction and Design</i>	3	
H. E. (18), <i>Principles of Food Selection and Preparation</i>	3	
Electives		6
	17	18

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SOPHOMORE YEAR

P. E. 3, 4	1	1
Bio. Ch. 1, <i>Organic and Biological Chemistry</i>	5	
Bot. 1, <i>General Botany</i> ; Zool. 48, <i>Principles of Zoology</i> ; or Biol. 1, 2, <i>Man and the Living World</i>	3—4	3
Econ. 1, <i>Principles of Economics</i> ; Econ. 2, <i>Principles of Economics</i> ; or Ag. Ec. 34, <i>Economics of Consumption</i>	3	3
H. E. (19), <i>Menu Planning and Service</i>		3
H. E. 25, 26, <i>Child Development</i>	3	3
Electives	3	4
	18—19	17

JUNIOR YEAR

P. E. 5, 6	1	1
Ag. Eng. 2, <i>Residence Planning</i>		2
H. E. (32), <i>Interior Decoration</i>	3	
H. E. 33, <i>Home Management</i>	3	
H. E. (35), <i>Home Management Residence</i>		3
H. E. 73, <i>Nutrition</i>	3	
Sp. (15), <i>Public Speaking</i>		3
Electives	7	8
	17	17

SENIOR YEAR

H. E. 83, <i>Family Development</i>	3	
Electives	14	17
	17	17

CLOTHING AND TEXTILES

FRESHMAN YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 1, 2	1	1
Ag. 1, <i>Orientation</i>	1	
Arts 23-24, <i>Elementary Drawing and Design</i>	2	2
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
H. E. 4, <i>Textiles</i>		3
H. E. 5, <i>Principles of Clothing Construction and Design</i>	3	
Math. Elective	3	
Zool. 48, <i>Principles of Zoology</i>		3
	17	16

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SOPHOMORE YEAR

P. E. 3, 4	1	1
Bact. 1, <i>General Bacteriology</i>	4	
Bot. 1, <i>General Botany</i>	4	
Chem. (45), <i>Organic Chemistry</i>		5
Clothing Elective	3 or	3
Econ. 1-2, <i>Principles of Economics</i>	3	3
H. E. 32, <i>Interior Decoration</i>		3
Psych. Elective	3	
Soc. Elective		3
Electives	0—3	0—3
	18	18

JUNIOR YEAR

P. E. 5, 6	1	1
B. A. 46, <i>Principles of Retailing</i>		3
Clothing Elective	3 or	3
Econ. 25, <i>Marketing</i>	3	
English and/or Speech Elective	2—3	
History Elective		3
Physics 9	4	
Elective	4—7	7—10
	17—18	17—20

SENIOR YEAR

Clothing Electives	3 or	3
H. E. 65, <i>History of Costume</i>	3	
H. E. 69, <i>Advanced Textiles</i>	3	
English and/or Speech Electives	3 or	3
Social Science Elective		3
Electives	5—11	8—14
	17—20	17—20

Additional suggested electives for those interested in the following areas:

Costume Design

Arts 5, 6, 8, 28, 88; Home Economics 48.

Interior Decoration

Agricultural Engineering 2; Arts 6, 8, 28, 88; Home Economics 33, 35, 48; Horticulture 27, 37.

Merchandising

Arts 28; Business Administration 45, 47, 68; Economics 51; Home Economics 48; Psychology 32.

Textile Research

Arts 6, 8; Chemistry 17; Home Economics 48; Psychology 32.

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FOODS, NUTRITION, AND INSTITUTIONAL ADMINISTRATION

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
P. E. 1, 2	1	1
Agr. 1, <i>Orientation</i>	1	
Arts 23, <i>Elementary Drawing and Design</i>	2	
Biol. 1-2, <i>Man and the Living World</i>	3	3
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
H. E. (18), <i>Principles of Food Selection and Preparation</i>	3	
Math. Elective	3 or	3
Electives		3
	17—20	17
SOPHOMORE YEAR		
P. E. 3, 4	1	1
Ag. Econ. 34, <i>Economics of Consumption</i> or Econ. 2, <i>Principles of Economics</i>		3
Chem. 45, <i>Organic Chemistry</i>	5	
Econ. 1, <i>Principles of Economics</i>	3	
H. E. (19), <i>Menu Planning and Service</i>		3
H. E. 51-52, <i>Quantity Foods and Purchasing</i>	3	3
Phys. (9), <i>Elementary Physics</i>		4
Psych. or Soc. Elective		3
Sp. 15, <i>Public Speaking</i>	3	
Electives	3	
	18	17
JUNIOR YEAR		
P. E. 5, 6	1	1
*Bact. 1, <i>General Bacteriology</i>	4	
Bio. Ch. 56, <i>Physiological Chemistry</i>		5
Chem. 17, <i>Introductory Quantitative Analysis</i>	4	
English and/or Speech Elective		3
*H. E. 73, <i>Nutrition</i>	3	
Electives	3—5	8—9
	15—17	17—18
*H. E. 48, <i>Field Work — Summer</i>	4	
SENIOR YEAR		
*H. E. 71, <i>Experimental Foods</i>	3	
Electives	14	17
	17	17

* Courses required to prepare for membership in the American Dietetic Association.

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Electives to be chosen from the following areas in order to meet professional requirements:

Foods and Nutrition Research —

Biological Chemistry 51-52; Chemistry 26; English (23); Home Economics 19, 74, 76; Zoology 17, 18

*Foods, Nutrition and Institutional Administration —

Education Elective; Home Economics 46, 48, 53, 55, 56, 74, 93; Psychology 32; Sociology Elective; Zoology 17, 18

Institutional Administration —

Business Administration 1, 2; Economics 2 (in sophomore year), 25, 51; Education Elective; Home Economics 46, 48, 51, 52, 53, 55, 56, 76; Psychology 32; Sociology Elective

HOME ECONOMICS EDUCATION

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 1, 2	1	1
Agr. 1, <i>Orientation</i>	1	
Arts 23, <i>Elementary Drawing and Design</i>	2	
Chem. 1-2, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
H. E. 4, <i>Textiles</i>		3
H. E. 5, <i>Principles of Clothing Construction and Design</i>	3	
H. E. (18), <i>Principles of Food Selection and Preparation</i>	3	
Electives		6
	17	17
SOPHOMORE YEAR		
P. E. 3, 4	1	1
Ag. Eng. 2, <i>Residence Planning</i>		2
Bot. 1, <i>General Botany</i>	4	
H. E. (19), <i>Menu Planning and Service</i>		3
H. E. 25-26, <i>Child Development</i>	3	3
Sp. 15, <i>Public Speaking</i>	3	
Zool. 48, <i>Principles of Zoology</i>		3
Clothing Electives	3	or 3
English and/or Speech Electives	3	or 3
	17	18

* Courses required to prepare for membership in the American Dietetic Association.

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JUNIOR YEAR

P. E. 5, 6	1	1
Bact. 5, <i>Public Health and Sanitation</i>	3	
Bio. Ch. 1, <i>Organic and Biological Chemistry</i>	5	
Bio. Ch. 6, <i>Chemistry of Food and Nutrition</i>		3
Econ. 1, <i>Principles of Economics</i>	3	
Econ. 2, <i>Principles of Economics</i> or Ag. Econ. 34, <i>Economics of Consumption</i>		3
Ed. 57, <i>Educational Psychology</i>	3	
Ed. 58, <i>Principles of Teaching</i>		3
H. E. 32, <i>Interior Decoration</i>		3
H. E. 33, <i>Home Management</i>	3	
Electives		3
	18	16

SENIOR YEAR

Ed. 59, <i>Principles of American Secondary Education</i>	3	
H. E. (35), <i>Home Management Residence</i>		3
H. E. 73, <i>Nutrition</i>	3	
H. E. 83, <i>Family Development</i>	3	
H. E. 84, <i>Personal, Family, and Community Health</i>		2
H. E. 91, <i>Methods in Home Economics Education</i> ..	3	
H. E. 94, <i>Supervised Teaching in Home Economics</i> ..		7
H. E. 96, <i>Seminar in Home Economics Education</i> ..		3
Soc. 33, <i>Cultural Anthropology</i>	3	
Electives	3	
	18	15

Additional requirements: teacher aptitude examinations in the spring semester of the sophomore year; field work under supervision, designed to meet requirements of those preparing to teach in federally-aided Home Economics departments, to be carried out during the summers following the sophomore and junior years.

TWO-YEAR NON-DEGREE CURRICULUM

The Thompson School of Agriculture offers several technical, non- degree, curricula to men and women who are interested in preparing for careers in the broad field of agriculture.

The College of Agriculture, University of New Hampshire, together with the Agricultural Education branches of the State and Federal Offices of Education cooperate in providing this educational program.

The Thompson School of Agriculture has a staff of well qualified instructors who are selected on the basis of teaching ability, experience, and an understanding of the problems of young people preparing for a vocation in agriculture. In addition to the Thompson School staff, the entire staff of the College of Agriculture is available for consultation and for any other assistance which its members may be able to give. Each

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student is encouraged to confer with anyone on the University staff who may be of possible help.

In the development of the various curricula offered by the Thompson School of Agriculture, careful attention has been given to the functional aspects of both the practical and scientific phases of the students' educational program.

These curricula are designed particularly for those who wish to prepare for technical careers in agricultural production, conservation, manufacturing, processing, distribution, and marketing.

Positions Open to Graduates

Graduates of the Thompson School of Agriculture have received a thorough technical education, therefore, they are in a favorable position to secure employment on the technical level in an agricultural field of their choice.

Those students who have demonstrated solid academic achievement and desirable personality traits quite frequently have a rather wide choice of positions. Some outstanding possibilities for employment are as follows: Agricultural Production—farm operators, managers, estate superintendents, florists, landscape gardeners, nurserymen. Conservation—soil conservation aids, forestry aids, fire control aids, engineering aids, county office managers, technicians, fish and game conservation officers. Agricultural Manufacturing—managers, foremen, and technicians in grain mills, fertilizer plants, agricultural chemical plants, farm equipment plants, and dairy equipment plants. Agricultural Processing—managers, foremen, and technicians in milk plants, packing plants, poultry dressing plants, and fruit and vegetable processing plants. Agricultural Distribution—owners, managers, salesmen, fieldmen, sales managers, and buyers for large and small business concerns wholesale and retail engaged in the distribution of agricultural products. Marketing—meat, poultry, and dairy inspectors, advertising, market reporters. Miscellaneous—bank agricultural representatives, artificial insemination technicians, research technicians, dairy herd improvement and breed association testers, farm realtor insurance agents, agricultural news, radio, and television commentators.

Many graduates are now successful operators of farms, greenhouses, and landscaping businesses in New Hampshire and other states. Others are employed as farm managers, herdsman, greenhouse managers, plant growers, and estate superintendents. An increasing number are being employed in many different capacities by agricultural cooperatives, feed, fertilizer, chemical and equipment companies scattered throughout New England, the Northeast, and other sections of the country.

Admission Requirements

The Thompson School of Agriculture is open to both men and women. Graduates of high schools will be admitted irrespective of age. Applicants who are not high school graduates must be 18 years of age and must have had at least two years of high school work or its equivalent. The applicant is not required to submit specific high school courses as prerequisites for admission. However, courses in Mathematics, Biology, and Chemistry have proven to be of real value in preparation for future course work in the plant and animal sciences. It is recommended that each prospective

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applicant take the College Board Scholastic Aptitude Test during his senior year in high school.

Requirements for Graduation

The completion of the program requires two calendar years. The instruction is divided as follows: the student obtains two semesters of classroom and laboratory work on campus, followed by a summer of supervised Agricultural Placement each year. However, it is possible for a student to attend the Thompson School of Agriculture for only two or more semesters, plus Agricultural Placement, and acquire considerable valuable information and first-hand knowledge of farming. Upon satisfactory completion of four semesters on campus, with a minimum of 68 semester credits plus two summers of Agricultural Placement in the order described, the student will be awarded a certificate of graduation.

The Agricultural Placement will be adapted to the personal needs and interests of the individual. This work may be conducted on the home farm, on some good commercial farm known to the student, or in some related agricultural occupation in which the student plans to engage. All placement situations selected by the student, through his own initiative, must be approved by the school staff. Every effort will be made to find suitable placement positions for students who are unable to locate such positions for themselves.

This practical training, required during each summer, will be under the direct guidance and supervision of the teaching staff. Certain records and reports are required of the student while on placement, and no student will be granted a certificate until such records and reports are complete.

Major Fields of Instruction

There are five major fields of instruction: Agri-Business, Dairy Science, General Agriculture, Horticulture, and Poultry Science. The student will select the one he wishes to pursue and may elect courses in other fields in order to provide for a well-balanced program.

Facilities for Instruction

Facilities of the University, including the University farm, dairy herd, milk plant, poultry plant, horticulture farm, livestock department, green-houses, and laboratories, are available for instructional purposes.

Financial Aid

The purpose of the financial aid program is to assist able and promising students who are unable to meet their educational expenses from their own or their family's resources. This may be done in one of the following ways or in a combination of two or more. *Deferred Payments.* Students who cannot pay their University bills in full may request permission to pay on the deferred payment plan. The initial payment, which is due prior to registration, shall be not less than $\frac{1}{3}$ of the total amount of the University bills. The balance is paid in 2 equal installments in the following two months. *Employment.* Various types of employment, on and off campus, are usually available. *Tuition Grants.* A resident of New Hampshire is eligible for consideration for a tuition grant. The amount

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varies from \$100 to full tuition. The award is based on financial need. *Loans.* The University of New Hampshire has a loan program which makes limited amounts available to students in need of this kind of assistance. No interest is charged until graduation or separation from the University.

Additional information and applications may be secured from the Financial Aids Office, Room 110, Thompson Hall.

Additional Information

Persons who are interested in the Thompson School of Agriculture should request a catalogue from the Thompson School of Agriculture, 14 Putnam Hall, University of New Hampshire, Durham, N. H.

The College of Liberal Arts

DAVID C. KNAPP, *Acting Dean*

MELVILLE NIELSON, *Assistant Dean*

DEPARTMENTS AND SCHOOL

THE ARTS

Fine Arts, Design, Crafts, Occupational Therapy, and Photography

BACTERIOLOGY

Medical Technology

EDUCATION

ENGLISH

GEOLOGY AND GEOGRAPHY

General Physical Science

GOVERNMENT

Public Administration Service

HISTORY

HOTEL ADMINISTRATION

LANGUAGES

French, German, Greek, Italian, Latin, Russian, and Spanish

MUSIC

PHILOSOPHY

PSYCHOLOGY

SOCIOLOGY

Social Service

SPEECH AND DRAMA

ZOOLOGY

Nursing and Pre-Medicine

WHITTEMORE SCHOOL OF BUSINESS AND ECONOMICS

Business, Economics, and Secretarial Studies

The departments of Chemistry, Mathematics, and Physics in the College of Technology and the departments of Botany and Entomology in the College of Agriculture offer major programs for students in the College of Liberal Arts.

PURPOSE AND OBJECTIVES

It is the purpose of the College of Liberal Arts, as a center of learning and scholarship, to help all of its members achieve an understanding of the heritage of civilization and to educate them in the traditions of the past and the realities of the present so that they may recognize and act upon their obligations to the future.

The College endeavors to meet the educational needs of each student through the development of interests and skills which, combined with the student's potential, makes possible the living of a richer and more useful life.

ORGANIZATION

The development of common interests and the coordination of educational efforts in behalf of students in the College are promoted by divisions as follows: Biological Sciences, Humanities, Physical Sciences, Social Sciences, and Teacher Education. The personnel of each division includes all Faculty members assigned to the College, and to departments of other colleges which are authorized to offer major programs or prescribed curricula in the College of Liberal Arts.

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The *Humanities Division* is composed of the staffs of the departments of The Arts, English, Languages, Music, Philosophy, and Speech and Drama. The *Social Sciences Division* is composed of the staffs of the Whittemore School of Business and Economics, and the departments of Government, History, Hotel Administration, Psychology, and Sociology. The *Physical Sciences Division* is composed of the staffs of the departments of Geology and Geography, and the departments of Chemistry, Mathematics, and Physics in the College of Technology. The *Biological Sciences Division* is composed of the staffs of the departments of Bacteriology and Zoology, and the departments of Botany and Entomology in the College of Agriculture. The *Division of Teacher Education* consists of the members of the instructional staff of the University who are teaching professional courses in Education. These include courses in the problems of teaching the subjects offered in the public schools and the courses in Physical Education, in The Arts, and in Music that are designed to prepare teachers.

The offerings of the College of Liberal Arts consist of two groups: the *General Liberal Arts* curriculum and the *Prescribed* curricula. Teacher Preparation curricula are also provided.

GENERAL LIBERAL ARTS CURRICULUM

The General Liberal Arts curriculum is intended primarily to provide a broad, liberal program and general education leading to the **Bachelor of Arts** degree.

A student enrolled in the General Liberal Arts curriculum will major in some subject or field of knowledge. Some of these major programs offer, at least in part, direct professional training. The Prescribed curricula are professional in character.

The objectives, opportunities, and requirements of majors in the General Liberal Arts curriculum are described in the paragraphs which follow. It is possible also for students in the General Liberal Arts curriculum to arrange programs of study in addition to those described below, although such students will be held strictly to the University and College requirements of the General Liberal Arts curriculum. *Students interested in arranging special programs of study should consult the Assistant Dean of the College.*

The Arts

The Department of The Arts offers two professional programs, Art Education and Occupational Therapy. A major in The Arts is open to students in the General Liberal Arts program who wish to concentrate in the visual arts. Many courses in the department are open to students in other major programs. Included are courses in history, design, drawing and painting, graphic arts, photography, advertising design, illustration, sculpture, ceramics, weaving, metal work and jewelry, wood-working and plastics, drafting, etc. A series of exhibitions are shown in the University Galleries. An experimental arts laboratory (The Student Workshop) is operated in Hewitt Hall. All courses in the department and the Student Workshop program are designed to develop intelligent enjoyment and a critical understanding of the arts, and to provide facilities for creative expression.

Several types of programs may be arranged to meet the individual needs of students majoring in The Arts. For example, one may concentrate in design and painting, or in the crafts area, or one may elect a program

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which provides opportunities in a combination of areas. The final program is worked out in consultation with the adviser at the time of declaring one's major.

Students majoring in areas in which an understanding of the arts may be desirable, such as business, education, hotel administration, home economics, etc., are invited to consider taking one or several courses in the department.

Students majoring in The Arts are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They must also earn 24 semester credits, with grades of C or better, in courses in The Arts. The following courses are required for The Arts major: Arts 23, *Basic Design* (does not carry major credit); Arts 31, 32, *Introduction to The Arts*. Courses in speech and drama, literature, music, and home economics may be approved as related work for a major in The Arts with the consent of the supervisor and the College Dean. The courses of each major program are selected to meet the needs of the student, as determined in conference by the student and his supervisor. An assigned major work and/or a paper in the student's area of specialization will be required in the senior year.

Students interested in majoring in *The Arts* are advised to consult with the supervisor, Professor John W. Hatch.

Bacteriology

Students interested in the study of bacteria and other microorganisms should register as majors in Bacteriology. Such students may prepare themselves for positions in universities, experiment stations, research institutes, industrial organizations, and in federal, state, or city laboratories. Opportunities are available in the fields of medical or public health bacteriology, animal diseases, and in sanitary, food, dairy, soil or industrial microbiology. Students may also prepare themselves for employment as sanitary inspectors or in other phases of public health work. Students primarily interested in hospital laboratory work should consult the *Medical Technology* curriculum.

Students who major in Bacteriology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete courses offered by the Department, and by related departments, to a total of 24 semester credits, with grades of C or better. *A course in Organic Chemistry is also required by Bacteriology majors, but cannot be counted as part of these 24 major credits.* The courses of each major program are selected to meet the needs of the individual student, as determined by the student and his supervisor in personal conference.

Students interested in majoring in *Bacteriology* are advised to consult with the supervisor, Professor Lawrence W. Slanetz.

Biology

Students who are interested in a broad background in the life sciences are advised to major in Biology. Such students will be required to take courses in bacteriology, botany, entomology, and zoology in building up a program. The field, however, is so inclusive that the majority of students will find it desirable to include one or two additional courses in one of the sub-divisions, such as Bacteriology, Botany, or Zoology. In addition to students who desire to study Biology for general education, it is suggested that those who are interested in *Applied Biology* and *Secondary-School Teacher Preparation* register as Biology majors. Students who are interested

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in Forest Game Management are advised to consider registration in the curriculum of that name offered by the Department of Forestry in the College of Agriculture.

TEACHER PREPARATION — Students who are planning to teach Biology in secondary schools are urged to plan for practice teaching during the senior year. As few positions are available in any year for teaching Biology alone, a student should include courses in his program of study which will qualify him for teaching other sciences.

APPLIED BIOLOGY — Students preparing for positions which involve the application of the science of Biology, such as those frequently listed by the federal civil service, the state governments, and industry, should follow the general program of Biology majors and should elect one or two additional courses in fields of Applied Biology. The Division is well fitted to assist in the preparation of students for work in fish and game research, conservation education, and in state departments of conservation. Students preparing for professions in this group should plan to secure advanced degrees, since positions in these fields are difficult to secure without graduate study. Students who are interested in hospital laboratory work should consult the *Medical Technology* curriculum.

Satisfactory completion of the requirements of a Biology major will generally qualify students for admission to graduate schools to specialize in Biology or in one of its major subdivisions.

Students who major in Biology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete courses offered in the Division to a total of 24 semester credits (exclusive of Biology 1-2 or 3 and Zoology 48) with a grade of C or better. The minimum course requirements for Biology majors include Bacteriology 1; Botany 3; one course selected from Botany 6, 12, 42, or 56; Entomology 2; Zoology 7; and one other course in Zoology (except Zoology 97, 98). *Biology majors are also required to complete Chemistry 3-4 and eight additional hours in physical science (Chemistry, Geology, Mathematics, Physical Science 1-2, or Physics). These courses in physical science cannot be offered as major credit.*

Students interested in majoring in *Biology* are advised to consult with the supervisor, Professor Paul A. Wright.

Botany

Students who are interested in plant life are advised to consider registration as majors in Botany. Botany majors with suitable undergraduate backgrounds may enter the field of secondary education or become research technicians. Botany majors, other than those whose interest is secondary-school teaching, research technique, or a general education, should expect to continue in graduate study here or elsewhere. Government work, institutional research, certain types of industrial positions, and college teaching are open to Botany students with advanced preparation. The principal fields of concentration in Botany are: (1) Pathology, (2) Physiology, (3) Taxonomy, (4) Ecology, (5) Morphology and Anatomy, (6) Cytology.

Students who major in Botany are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They must also complete courses offered by the Department, to a total of 24 semester credits with grades of C or better. Courses in other departments closely related to the major courses may be counted with the consent of the major

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supervisor and the College Dean. A broad background in chemistry and other biological sciences is considered essential for most major students.

The courses of each major program are selected to meet the needs of the individual student, as determined by the student and his supervisor in personal conference.

Students interested in majoring in *Botany* are advised to consult with the supervisor, Professor Albion R. Hodgdon.

Chemistry

Students who are interested in the study of Chemistry will find opportunities in such fields as individual work involving the development of processes or production activities or sales work based on a scientific knowledge of the marketable products, the teaching of Chemistry and allied subjects in secondary schools or of Chemistry in colleges, and graduate study for those students who are interested and particularly proficient in their undergraduate work.

The University offers two channels for study of Chemistry: majoring in the subject in the College of Liberal Arts, or enrolling in the Prescribed curriculum in *Chemistry* in the College of Technology. In the College of Liberal Arts a major should complete Chemistry 3-4, *General Chemistry*, or preferably Chemistry 5-6, *Inorganic Chemistry*, certain courses in Mathematics and Physics, and in addition other courses offered by the Department in *Analytical, Organic, and Physical Chemistry* to a minimum of 24 semester credits, with grades of C or better. According to the student's interests, other supporting subjects may be elected to form a broad program of study and to prepare for one of the opportunities listed above. Majors in Chemistry are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95).

The Department is equipped to furnish the preparation necessary for teaching Chemistry in secondary schools. As very few positions are available in any year for teaching Chemistry alone, a student should consider a program of study which may qualify him for teaching Chemistry and other sciences, and should consult with the Chairman of the Department of Chemistry and Professor Everett B. Sackett of the Department of Education. Students who are interested in teaching Chemistry in college are advised to plan on graduate study.

Students who plan to major in *Chemistry* are advised to consult with the Chairman of the Department of Chemistry as early in their college program as possible.

Economics

Students who are interested in economics and business life, but do not desire to specialize intensively in the Business curriculum or the Secretarial curriculum, are advised to consider registration as majors in Economics. Students who intend to enter upon graduate study in Economics should plan to major in this field as undergraduates. An increasing number of opportunities in business and the public service are open to young people who possess graduate preparation in Economics.

Business positions in retail stores, chain stores, banks, sales organizations, general business offices, insurance, and other firms have been successfully filled by graduates of the University who have majored in Economics. The Business curriculum provides specific preparation for several of these fields

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by reason of its specialized requirements. A student who desires breadth in his education, with an emphasis on Economics, is counseled to major in the Department.

The Department is equipped to furnish the preparation necessary for teaching Economics in secondary schools. As very few positions are available in any year for teaching Economics alone, a student should consider a program of study which may qualify him for teaching Economics and other social studies, and should consult Professor Degler and Professor Everett B. Sackett of the Department of Education.

Students who major in Economics are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are required to complete successfully Economics 1-2, *Principles of Economics*; and Economics 31, *Economics and Business Statistics*. They are required to complete 24 semester credits of Economics, with grades of C or better. Of these 24 semester credits, a minimum of 12 credits must be in courses in Economics numbered 51 or higher. *Major credit toward the 12 semester hours required in courses numbered above 50 will be approved in the case of transfer students only if such courses have been taken as upper division courses, i.e., in the junior or senior year.* Individual programs will be arranged to meet the needs of the individual student. *Business Administration* 1-2, 21-22, 68, and 70 may be counted for major credit in *Economics*. *Business Administration* 68 and 70 may be counted in partial fulfillment of the requirement that 12 semester credits be in courses numbered 51 or higher.

Students interested in a major in *Economics* should consult with the supervisor, Professor Carroll M. Degler.

Education

Students who are interested in preparing themselves for teaching in the secondary schools are referred to the section on "Preparation for Teaching" starting on page 87.

Those students who are interested in teaching or supervising in elementary schools, and who are graduates of two- or three-year normal schools or teachers colleges, may major in Education. They are required to complete at the University, with grades of C or better, 12 semester credits of work in elementary education selected from the advanced courses in that subject as a part of the total credits which are required of them as candidates for the degree of Bachelor of Arts. Such students will select the remainder of their major programs with the advice and approval of the Chairman of the Department of Education. (See special Language requirement, page 95.)

Some courses offered in Education are designed to be of interest to the general student.

Professor Everett B. Sackett is supervisor of majors in Education.

English

The Department of English offers two programs of study: the *Literature* major and the *Teaching* major.

The *Literature* major must fulfill the requirements of the General Liberal Arts curriculum (page 95). He must also complete English 13 and must earn grades of C or better in 24 semester credits in literature courses

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numbered above 50: of these, 6 credits must be in Shakespeare (English 57, 58); 6 credits in American literature (this requirement may be satisfied by English 15, 16, but the 6 credits thus earned cannot be counted toward the 24 major credits); and an additional 12 credits in at least three centuries of English literature prior to the twentieth.

The *Teaching* major must meet in full the requirements of the General Liberal Arts curriculum (page 95) and the state certification requirements for teaching. He must also take the following courses, 24 credits of which must be passed with the grade of C or better:

English 13, 14

English 16

English 22

English 25

English 27

English 43, 44, and 45

English 57 or 58

English-Education 91

Speech 28 or 62

Speech 64

Students who are interested in majoring in *English* should consult with the supervisor, Professor Sylvester H. Bingham.

Entomology

The Department of Entomology offers various courses for students who wish to specialize in the study of insect life, insect control, and insects in relation to man. There are many fields open to those qualified in Entomology. There are opportunities for employment in public institutions and organizations, and in addition, there are many opportunities for employment with commercial and industrial firms which frequently employ college graduates who have majored in this field of study. Graduate study is desirable for the student who seeks high achievement in Entomology. A more intensive program in Entomology may be secured in the Prescribed curriculum offered in the College of Agriculture.

Students who major in *Entomology* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete successfully courses offered by the Department, to a total of 24 semester credits, with grades of C or better. Courses in other departments may be counted with the consent of the major supervisor and the College Dean.

Outlines of specific suggested programs of study are available to the student upon request to the supervisor, Professor James G. Conklin.

General Physical Science

A student having broad interest in physical science, but no professional objective in any one of the recognized sciences in this field, may register as a *General Physical Science* major.

Students who major in General Physical Science are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). In addition, they must complete each of the following courses, and achieve in them an overall grade point average of 2.3 or better: Mathematics 7-8, *Fundamental Mathematics*, 9-10, *Differential and Integral Calculus*, and 30, *Astronomy*; Chemistry 3-4, *General Chemistry*, and 21, *Semimicro Qualitative Analysis*; Geography 21, *The Weather*, and 22, *Climates of the World*; Geology 1-2, *Principles of Geology*; and Physics 1-2, *Introductory Physics*.

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Students who are interested in choosing *General Physical Science* as a major should consult with the supervisor, Professor William H. Wallace.

Geology

The field of geology includes the earth sciences. This is not alone the study of minerals, rocks, and evidence of prehistoric life. It includes also the history of the earth from its beginning, as well as the evolution of the landscape, and other environmental features which have influenced the development of life on the earth, including man.

Students who are interested in the earth sciences, both those who expect to make some phase of geology their life work, and those who desire to build a program of liberal studies around a core of geological and related subjects, are advised to register as majors in *Geology*.

The search for new sources of essential mineral resources and the development of new uses for certain minerals have emphasized the need for men trained in the earth sciences. Positions as mining geologists, petroleum geologists, mine operators, federal and state survey geologists, and university and college professors of geology and mineralogy have been successfully filled by graduates of the University who have majored in Geology. Other former major students are teaching in high schools or are in business, some in fields where their geologic preparation is useful, as in the cement and mining-machine industries.

Students who major in Geology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete Geology 1-2, *Principles of Geology*, and, in addition, courses in Geology or related courses approved by the supervisor and the College Dean to a total of 24 semester credits with grades of C or better. The courses of each major program are selected to meet the needs of the individual student, as determined by the student and his supervisor in personal conference.

At the end of the senior year, a student who majors in Geology must, after consultation with his supervisor, submit either a satisfactory paper or pass a written comprehensive examination.

Students who are interested in majoring in *Geology* are advised to consult with the supervisor, Professor William H. Wallace. After a student's major interest is determined, the advice, assistance, and counsel of one or more additional members of the Department will be sought where a special area of concentration is contemplated by the student. For example, the student whose special interest lies in geographic or meteorologic fields will be assigned to the staff members responsible for these fields.

Government

The courses offered by the Department of Government are designed to aid the student in gaining a knowledge of the nature, functions, and problems of government, and of the place of government in the modern world. For this general purpose, courses are offered in public affairs — local, state, national, and international. Some courses listed by the Department are chiefly intended to provide information needed for intelligent and responsible citizenship and to provide a part of a liberal education. Others are of a specialized nature and have been planned to provide basic preparation for professional work. A few are intended to stress the historical and

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philosophical development of the growth of political thought and institutions.

By specializing in one of several programs of Government, the major student may prepare himself for graduate study in political science and government, public administration, research in government, the study of law, graduate study for the foreign service, or teaching government courses in secondary schools. Students who are preparing to teach government courses in the secondary schools should check their planned program of study with Professor Everett B. Sackett of the Department of Education. Ordinarily, prospective teachers of government courses will find it necessary to teach related courses in the social sciences.

Majors in *Government* have an unusual opportunity for mastering research techniques and gaining practical information concerning state and local government in New Hampshire through work as an intern in an approved public or private agency. For this program the student should enroll in Social Science 81, *Internship*, with the prior permission of the Chairman of the Department of Government. Further opportunity for similar research may be gained in Government 65.

Majors in *Government* are expected to meet all requirements of the General Liberal Arts curriculum (page 95). All major students are required to take Government 5, *Elements of Political Science*, and Government 6, *Principles of American Government*. Students who expect to major in *Government* are advised to register for these courses during the freshman or sophomore year. Students majoring in *Government* are also required to complete a research paper approved by the staff. This project constitutes the chief part of *Research in Government Problems*, Government 65. A major consists of a minimum of 24 semester credits of work with grades of C or better in *Government* and in any related courses which may be approved by the supervisor and the College Dean. The 24 semester credits should include not less than 12 in courses above 50. Not more than 9 credits earned as an intern in Social Science 81 may be counted toward the completion of the major requirements. Each student will be counseled individually and his program of study planned for his needs.

Students interested in electing *Government* as a major should meet with the supervisor, Professor John T. Holden.

History

History, as a field in which to major, may be of interest to the following groups of students: (1) Those who wish to do college teaching in history. Graduate study is indispensable for such work, but preparation may be made for it by a certain amount of undergraduate specialization. (2) Those who plan to teach history in secondary schools. For such a position, training in other social studies is highly desirable, if not absolutely necessary. The student is therefore advised to keep in touch with the Department of Education, as well as with the Department of History, with a view to satisfying teaching certification standards and building a well-rounded program of studies. (3) Those who intend to enter other professional fields in which a considerable amount of historical knowledge is desirable. Such a field, for example, might be that of library training in which an historical preparation would rank with study in literature as a background, or the increasingly important profession of archivist. (4) Any students who feel free to plan the college program without too specific reference to a vocation, and who have a special interest in history.

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Students who major in *History* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They must earn 24 semester credits in courses in History, with grades of C or better, exclusive of History 1, 2, which must include a minimum of six semester credits from *Group A* and a minimum of six semester credits from *Group B*. (See the description of courses offered by the Department.) A student who majors in *History* must prepare a satisfactory paper on a subject approved by the supervisor, in the student's field of concentration. The student must secure approval of the subject chosen, from the Chairman of the Department, before December 15 of the student's senior year and the completed paper must be filed with the Chairman of the Department before April 1 of the year in which the degree is to be granted.

Students planning to major in *History* should consult with the supervisor, Professor Philip M. Marston.

History and Literature

Students who desire a broad education may take a combined major in *History and Literature*. Students who plan to enter library service may also find here a desirable major. The program of this major offers an opportunity to study the history and literature together of France, of Germany, or of Spain. A still broader survey of European history and of its literature is also possible. The program involves the completion of 24 semester credits with grades of C or better in one of the following groups of courses, of which 12 credits should be in History and 12 credits in Languages:

- I History 9, 10, 19, 20, 83, 84;
Spanish 5-6, 51, 52, 55, 56, 65, 66;
- II History 19, 20, 83, 84;
French 5-6, 51-52, 53-54, 55-56;
- III History 19, 20, 83, 84;
German 5-6, 53-54, 55-56, 57-58;

A student who has met the major requirements in *History and Literature* and other requirements of the General Liberal Arts curriculum (page 95) will be recommended for the Degree of Bachelor of Arts with the notation "History and Literature" on the Commencement program.

Students' registration cards may be signed by either Professor Philip M. Marston, Chairman of the Department of History, or Professor R. Alberto Casas, Chairman of the Department of Languages.

Students electing option I, II, or III will be encouraged to do a considerable part of their reading for the History courses in Spanish, French, or German, respectively.

Languages

A major student in the Department of Languages may have a professional or cultural objective. Many majors plan to enter secondary-school or college teaching. For such students there is no hard and fast curriculum. The arrangement of Language courses is sufficiently flexible to meet the individual's needs. As most language teachers are obliged to teach more than one language, or one language in combination with other subjects, students should not plan to concentrate in a single language and its literature, but to map out a program including two languages (preferably

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French and Latin), or one language with a number of courses in English or History. Students who may desire departmental recommendations for teaching a modern language should include French 3-4, German 13-14, or Spanish 3-4 in their major programs. Prospective teachers should consult the Chairman of the Department, Professor R. Alberto Casas, and Professor Everett B. Sackett, Chairman of the Department of Education. Some departmental majors plan to enter library service. Most library schools require two foreign languages.

Major students who do not plan to teach usually have a cultural objective. Here again the flexibility of the departmental offerings makes it possible to arrange individual programs for individual students. Some students find a special appeal in a single foreign literature and wish to explore it thoroughly. Others find that the study of two or three languages and literature is a broadening and stimulating experience. As most graduate schools require a knowledge of one or two foreign languages, all students who may possibly do graduate work in any field should obtain a reading knowledge of French and German.

For non-majors, there are offered three courses which are given in English. These courses offer, respectively, a survey of Greek and Latin Literature (in translations), a survey of Modern European Literatures (in translation), and an introduction to Romance Philology.

Students majoring in the Department of Languages are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95), and must designate *French, German, Latin, Romance Languages, or Spanish* as their particular major. Elementary courses (French 1-2, German 1-2, Greek 1-2, Italian 1-2, Latin 1-2, Russian 1-2, and Spanish 1-2) cannot be counted for major credit. A major in a single language (*French, German, Latin, or Spanish*) must comprise a minimum of 18 major credits in a particular language. The remaining 6 credits may be earned in other designed courses in the Department. A major in *Romance Languages* must comprise courses in both French and Spanish (not including French 1-2 or Spanish 1-2) with a minimum of 12 major credits in each.

The special supervisor for majors in *French* is Professor James C. Faulkner; for majors in *German*, Professor Alexander P. Danoff; for majors in *Latin*, Professor John S. Walsh; for majors in *Spanish* and *Romance Languages*, Professor R. Alberto Casas.

Attention is called to the combined major in *History and Literature*.

Mathematics

Over and above the benefits to be derived from the study of mathematics for its own interest, it is being recognized, even more forcefully, that such study will give the student essential and invaluable equipment for any scientific pursuit. The courses in mathematics are intended to provide a sound preparation in the fundamentals of the subject, as well as to offer a sufficient variety of subject matter to meet diversified interests. Courses are designed to prepare the student who majors in *Mathematics* for opportunities in various fields. Among them are work in statistics, such as government agencies, business, life insurance, and the application of statistics to problems in education, economics, sociology, psychology, medicine, and genetics; teaching mathematics in secondary schools; graduate study for those students who are interested and especially proficient in their undergraduate work; many industrial opportunities requiring mathematics for research in applied problems and consulting work.

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All students who major in *Mathematics* must meet in full the requirements of the General Liberal Arts curriculum (page 95), and must complete, with grades of C or better, at least 24 semester credits in Mathematics (exclusive of Math. 2, 3, 7-8, and 21), including Math. 62 and 68.

All students who are interested in a *Mathematics* major should consult with the supervisor, Professor Donald M. Perkins.

Music

The Department of Music offers a major program in the General Liberal Arts curriculum. Studies such as history, literature, and appreciation of music endow the student with cultural values which enrich his entire life. Instruction offered in the Department of Music is designed to develop musicianship, the ability to perform and capacity to teach, supplemented by the general education required by the College of Liberal Arts. The broad scope of subjects available within the Department equip the student with a basis for professional competency and at the same time provide the foundation and stimulus for graduate study.

Instrumental and vocal instruction are given in private lessons, while class instruction provides for the pursuit of academic studies. Student recitals, instrumental and vocal ensembles, Men's and Women's Glee Clubs, the University Concert Choir, Symphony Orchestra, and Symphonic Band afford both laboratory and concert experience in a variety of performance settings.

The expanding and dynamic force which music is fast becoming in contemporary American society is reflected by increased demands for teachers of music; performers; music librarians; radio, recording, television, and movie musicians; music therapists; and higher standards of quality and performance of music in places of worship.

The Department of Music offers courses leading to the Bachelor of Science degree with a major in *Music Education* (see page 90 for curriculum requirements).

A major in *Music* is offered with three options in concentration. All students must complete the requirements of the basic theory courses: Music 9-10, 11-12, 13-14, and 15-16; and the basic history-literature course, Music 37-38. In addition, the specific requirements of each option are given below:

I. Music History: advanced theory (4 credits); advanced history and literature (12 credits); Music 23 and/or Music 26 (8 credits).

II. Applied Music: qualified students may major in voice, piano, organ, strings, woodwind or brass (a student choosing this option must pass a performance examination before the Department of Music staff); advanced theory or literature (4 credits) and applied music (16 credits—2 credits per semester). A senior recital also must be presented.

III. Theory: emphasis on musical composition; advanced theory (12 credits), advanced history (4 credits), and Music 23 (8 credits).

Students majoring in *Music* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They must also earn grades of C or better in all courses required of the *Music* major.

The Department of Music is a Member of the National Association of Schools of Music.

Prospective majors in *Music* are advised to consult with the supervisor, Professor Karl H. Bratton.

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Philosophy

From the historical point of view, philosophy is particularly effective in unifying the various intellectual disciplines that make a university. But philosophy also has its own distinctive method and subject matter. The courses in the Department of Philosophy reflect this division of function.

Students who are interested primarily in the history of ideas may select courses from a sequence which covers the history of philosophy from the early Greek philosophers to those of the contemporary world.

Students who prefer to concentrate on a more limited but more systematic and intensive study may choose from a sequence of courses covering the most important divisions of philosophy itself: logic and epistemology, metaphysics, ethics, philosophy of religion, and aesthetics.

Courses in the latter group make it possible to combine philosophy with other work in the humanities, especially the arts, English, and classical literature, and with appropriate work in the social sciences. Wherever it is possible, the work of the course is made relevant to other fields in which students may be concentrating.

Students in the following groups may find philosophy of particular value: those who intend to undertake graduate work in some division of the humanities or in some branch of the social sciences, or those who intend to enter a theological school or seminary or who intend to specialize in religious education.

At the present time, the Department does not offer a major in Philosophy.

Physics

The major in *Physics* is intended to prepare students for a diversity of interests in the application of this fundamental science. Broad in scope, the program provides electives so that a student may supplement his work in physics by that in other fields such as mathematics and the allied sciences. The intermediate courses are intended to give the student a thorough grounding in fundamentals in a particular branch of physics. Some of these courses are supplemented by appropriate laboratory work. Opportunity is given in the senior year for the major student to do some elemental investigation of his own choosing under guidance. Graduates of this major are eligible for employment in the various industrial, government, and armed services laboratories or they may continue study in the academic field leading to advanced degrees.

Students who major in *Physics* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are required to complete 24 semester credits, in addition to the introductory courses, with grades of C or better, and *must elect Physics 18, 23-24 as the introductory course in place of Physics 1-2*. Since proper preparation in mathematics is essential, the student should elect in the freshman year if possible, Mathematics 21-22, in order to have the prerequisites for the courses that follow. If Mathematics 7 has been passed with a grade of B or higher, students in the College of Liberal Arts may be admitted to Physics 18, 23-24 while taking Mathematics 8, 9-10 concurrently, with the specific approval of the Department of Physics, provided grades of at least B in mathematics are maintained. Liberal Arts students who wish to register for advanced courses in physics should discuss the mathematical prerequisites with the Department of Physics. Seniors are required to participate in a colloquium, Physics 97-98.

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Students who wish to major in *Physics* are advised to consult with the supervisor, Professor Harry H. Hall.

Psychology

Some students may wish to major in *Psychology* for the purpose of understanding themselves and others more adequately and of gaining knowledge of scientific methods of studying human behavior. Others may not only have these aims in mind but also may wish to specialize in psychology to prepare themselves for one of the following professional objectives: college teaching; personnel work in industry or government; supervision of psychological testing in mental hospitals, juvenile courts, city school systems, child guidance clinics, and the federal civil service; counseling and guidance in secondary schools and colleges; or clinical practice.

Students who contemplate major work in psychology as a means of preparing for a profession should keep in mind the necessity of graduate work. For non-majors, a background of psychology will be an asset in teaching, nursing, social work, business and industrial management, or in professions such as medicine and law in which human relations are of primary importance.

Students who major in *Psychology* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are required to complete 24 semester credits with grades of C or better in courses in psychology and in such related courses as may be approved by the supervisor and the College Dean. Psychology 95, *Advanced General Psychology*, and Psychology 98, *Seminar in Psychology*, are required of all majors and must be passed with a grade of C or better. Psychology 57, *Experimental Psychology*, and Psychology 67, *Statistics in Psychology*, should be taken by all psychology majors who are planning for graduate work. A comprehensive paper on a subject approved by the supervisor is required. This paper is the core project in Psychology 98.

Students who wish to major in *Psychology* are advised to consult with the supervisor, Professor Herbert A. Carroll.

Sociology

The major in *Sociology* is for students who desire a liberal education with emphasis on study of the organization and differentiation of society, including study of the research methods developed in recent years for a better understanding of social phenomena; students who intend to do graduate work in sociology; or students who plan to attend a graduate school of social work but prefer a broader choice of undergraduate electives than the prescribed Social Service curriculum permits.

The Social Service curriculum, with its field experience and its concentration on pre-professional courses, not only prepares students to enter graduate schools of social work but also has been quite successful, for a number of years, in preparing them for junior positions in social work prior to graduate study.

Students who wish to teach sociology in secondary schools are advised that such teachers usually have to teach related social studies. Students with this vocational aim should consult with Professor Everett B. Sackett of the Department of Education.

Majors in *Sociology* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). It is recommended that they

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take Sociology 1, *Introductory Sociology*, during their freshman or sophomore years. In addition, they must complete a minimum of 24 semester credits with grades of C or better in Sociology (or in any related course approved by the supervisor and the College Dean). Sociology 85, 86, *Development of Sociological Thoughts*, Sociology 92, *Fields of Sociology*, and Sociology 75, 76, *Methods of Social Research*, are required. At the end of the senior year majors must pass a written comprehensive examination.

Students who are interested in choosing *Sociology* as a major should consult with the supervisor, Professor Richard S. Dewey.

Speech and Drama

The Department of Speech and Drama offers a major with two options: *General Speech* and *Drama*. A major in either *General Speech* or *Drama* makes an excellent focal point for those students desiring a liberal education combining course work in the humanities, literature, the arts and social sciences. The purpose of this major is to offer a broad program for students interested in: a liberal education stressing the speech arts; a pre-professional background for careers in such fields as public service, teaching, law, ministry, public relations, social administration, and personnel work; basic preparation for the teaching of speech and drama, direction of debate, drama and other speech activities in secondary schools, community theater direction, and professional training for television, theater, and speech correction.

Courses in speech and drama may also be elected for their cultural value by students pursuing other majors.

Those seeking a major in *General Speech* should acquire a good background in English language and literature, history, government, philosophy, and psychology. They should be able to speak and write well, and they should acquire a reasonable proficiency in public speaking and oral reading.

Those seeking a major in *Drama* should combine that study with a wide variety of liberal arts courses in such fields as history, dramatic literature, philosophy, the arts, music, and psychology.

The following three-credit courses are required of all Speech and Drama majors: Basic Speech (without major credit), Discussion (without major credit in General Speech), and Introduction to Theater (without major credit in Drama).

For majors in the *General Speech* option, the following three-credit courses are required: Debate, Theater and Its Drama, Rhetoric in the Western World, Stagecraft, and Speech Correction. Six credits are also required in specific courses in literature* in related departments as approved by the major adviser and not also used to satisfy Group, College, or University requirements. Individual students may be allowed to substitute Television and Radio Workshop for Stagecraft with the approval of the major adviser. Stagecraft will contribute considerable background for the course in Television and Radio Workshop.

For majors in the *Drama* option, the following three-credit courses are required: Theater and Its Drama, Stagecraft, Acting, Directing, and Scenic Design and Lighting. Six credits are also required in specific courses in dramatic literature* in related departments as approved by the major

* Each student's individual program will be considered with regard to breadth and individual needs in assigning courses in related departments. Approval must be secured in advance of registration for credit for courses in this area.

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adviser and not also used to satisfy Group, College, or University requirements.

All majors will be required to write a satisfactory paper and/or satisfactorily complete a special project during their senior year. The student must secure approval of the subject of the paper and/or the special project from his major adviser before the Christmas vacation of his senior year and file the completed paper and/or project with the major adviser before the 15th of May of the year in which his degree is to be granted.

To count for major credit the courses required must be completed with a grade of C or better.

Students who wish to major in *Speech* and *Drama* should consult with the supervisor, Professor Joseph D. Batcheller.

Zoology

Zoology, the science of animal life, is the study of the structure, functions, development, and classification of the various animal forms. The student may major in *Zoology*: because of a general educational interest in the subject; because of his avocational interest in nature study; or to prepare for professional work in pure science or in applied zoology. Fish and game research, important in the conservation of our natural resources, is an example of applied zoology. Students who are interested in entering the fields of applied zoology should plan to secure advanced degrees since positions in these fields are difficult to obtain without graduate study. Undergraduate preparation for students who are interested in applied zoology generally should parallel that of any students planning to enter graduate work in zoology. Students who are interested in Forest Game Management are advised to consider registration in the curriculum of that name offered by the Department of Forestry in the College of Agriculture.

The University of New Hampshire's location on tidewater and near the open ocean provides an unusual opportunity for the study of marine zoology and marine ecology.

All students who major in *Zoology* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95) with grades of C or better in 24 semester credits in Zoology. Related courses in other departments may be counted for major credit with the consent of the supervisor and the College Dean. Minimum course requirements for Zoology majors include: Zoology 7-8, Zoology 18 (4 cr.) or 57 or 59, and Botany 3 or 6; eight of the 24 major credits must be in courses numbered 51-100. *Zoology majors are also required to present credit for Chemistry 3-4 and a course in Organic Chemistry (Chemistry 45, 51-52, or Biochemistry 1). These courses in Chemistry cannot be counted as part of the 24 major credits.*

Students who are interested in a *Zoology* major are advised to consult with the supervisor, Professor Philip J. Sawyer.

OTHER PROGRAMS OF STUDY

Although pursuing his studies in the College of Liberal Arts in one of the major fields just outlined, the student may also prepare himself for some related objectives. Two of these are described below and there is enough freedom of election to make it possible for the student, in consultation with his supervisor, to arrange others.

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Pre-Dental

Students who plan to enter a school of dentistry may follow the Pre-Medical curriculum (page 85), or they may elect to major in almost any field offered under the General Liberal Arts curriculum (pages 66-80). The student's program should include courses in comparative anatomy, physics, and organic chemistry. Students who plan to enter a school of dentistry, either before or after achieving the bachelor's degree, are advised to consult with Professor Philip J. Sawyer.

Pre-Law

While the various bar associations and law schools do not prescribe a specific undergraduate curriculum for future lawyers, they recommend that a student who contemplates entering law school should plan a study program which will develop breadth of view and facility of expression. They also urge him to acquire a background of information concerning the society in which he lives and the forces which have shaped modern institutions. They urge him particularly to perfect his use and understanding of the English language in writing and speaking.

The courses considered most helpful are those which develop oral and written expressions, deal with man's social, economic, and political institutions, provide an understanding of the human mind, and develop the art of thinking. A course in the elements of accounting may be useful.

A number of law schools require the *Law School Admission Test* of students seeking admission; each law school will advise a student upon request whether or not he will be expected to take the test in partial satisfaction of admission requirements. Particulars of the examination may be obtained at the office of the Department of Government.

Students who plan to enter law school after graduation are advised to consult with Professor John T. Holden, Chairman of the Department of Government, as soon as they have made their decision.

PREScribed CURRICULA

Several prescribed programs of study, intended to provide preparation for business or professional life, are available to students in the College of Liberal Arts. They are arranged in such a manner as to permit considerable specialization while conserving the breadth and general culture of the students enrolled in them. They are less broad and general, however, than the *General Liberal Arts* curriculum. They are definitely professional in character. All *Prescribed* curricula lead to the degree of **Bachelor of Science**.

Business Curriculum

One curriculum with an option is offered in this field: a curriculum for students who do not desire to specialize in any particular phase of business; an option for those desiring to specialize in accounting. The Business curriculum provides for general education as well as for professional preparation in business subjects. For students interested in marketing and distribution, in finance, or in labor and personnel administration, a list of courses in these areas is offered. Students may choose electives from these groups. Many of the graduates of the *Business* curriculum are successfully

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filling responsible positions with accounting, banking, insurance, merchandising, and manufacturing concerns.

The *Business* curriculum is planned to emphasize foundation or general courses in the freshman and sophomore years with specialization coming largely in the junior and senior years. The program is outlined on pages 100 and 101. Students registered for this curriculum are held for the requirements expected of students in all prescribed curricula (page 97). Students pursuing the *Business* curriculum must obtain grades of C or better in 24 semester credits from the following courses; Business Administration 1-2, 21-22, 23, 34; Economics 1-2, 25, 31, 51, 53, 56; and Speech 15. Of the required courses in Economics and Business Administration, at least 12 semester credits shall be earned at the University of New Hampshire.

Students pursuing the *Accounting* option must obtain grades of C or better in 24 semester credits from the following courses: Business Administration 1-2, 3-4, 7-8, 21-22, 23, 55, 56, 57, 61, 68; Economics 1-2, 25, 31, 53, 56; and Speech 15. Of the required courses in Economics and Business Administration, at least 12 semester credits shall be earned at the University of New Hampshire, and at least six of these semester credits shall be in accounting courses.

Students interested in registering for the *Business* curriculum or the *Accounting* option should consult with the Chairman of the Department, Professor Arthur W. Johnson. Those who elect either of the curricula will be assigned to a member of the department staff who will act as supervisor for the duration of the student's course.

Hotel Administration Curriculum

The hotel administration program gives basic preparation for careers in professional management and technical specialist positions in the hotel, motel, club, and food service fields. Many graduates become managers of city and country clubs, industrial, school and university food services as well as hotels, motels, and restaurants. Others are more qualified for technical specialty careers in hotel sales, institutional food sales, accountants and cost controllers in hotels or restaurants, or teachers in high schools and colleges offering food service courses. Still others work for government agencies dealing with travel and vacation business; some become journalists for periodicals concerning these fields or enter the travel agency business.

To insure that graduates know both the basic skills as well as the broad field of hotel administration, each student is required to complete at least two summer practicums of on-the-job experience. This work is directed and evaluated by the Department and University credit is given as well as a modest wage plus room and board. Transfer students and others may satisfy part or all of practical experience requirement by presenting evidence of having performed similar work. Five practicums are available: restaurant management, front-of-the house in a commercial hotel, back-of-the house in a commercial hotel, club management, and institutional food service.

The *Hotel Administration* curriculum is outlined on page 102. Interested students should consult with Professor Donald E. Lundberg.

Medical Technology Curriculum

There is now a large and increasing demand for medical technologists. Public health and medicine depend more and more upon the laboratory.

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Professional technicians are needed to perform various laboratory techniques and tests, such as blood typing, blood counts, tissue sections unrinalyses, and bacteriological and serological tests. Positions in this field are available in hospital laboratories, physicians' and surgeons' clinics, and in health department laboratories.

Students who are interested in becoming medical technologists should register in the Prescribed curriculum in *Medical Technology*. In this program students will take their freshman, sophomore and junior years' work at the University and their last year's work at the Mary Hitchcock Memorial Hospital School of Medical Technology, Hanover, New Hampshire. After satisfactorily completing the courses at the School of Medical Technology (Biology 61-62), the student is awarded 32 credits toward the Bachelor of Science degree. This program also qualifies the student for the examination for the Medical Technologist's certificate administered by the Registry of Medical Technologists of American Society of Clinical Pathologists. Thus a student can obtain the B.S. degree from the University and the M.T. certificate in a four-year period. Students who complete this curriculum are well qualified for work in any hospital or medical laboratory. The curriculum is outlined on page 104.

At the present time, the fees for the senior year include a University tuition fee of \$50 for New Hampshire residents and \$120 for non-residents and a maintenance fee of \$300 (including room and board) at the Mary Hitchcock Memorial Hospital School of Medical Technology. The latter institution has a stipend program which provides \$600 for students meeting the requirements of this program.

Students in the *Medical Technology* curriculum are held for the requirements expected of students in all prescribed curricula (page 97). They must also obtain grades of C or better in 24 semester credits from the following courses: Zoology 17, 18; Bacteriology 1, 8, 53; Chemistry 17, 45; and Biochemistry 56.

Students who in their junior year decide not to take the training program at the Mary Hitchcock Memorial Hospital School of Medical Technology will find it possible to transfer to a major in the General Liberal Arts curriculum, such as Bacteriology or some other biological science. In such case, they would have to satisfy a language requirement which may be met by passing a reading test based on two years of language taken in high school or one year of college language.

Students interested in the Prescribed curriculum in *Medical Technology* are advised to consult with the supervisor, Professor Theodore G. Metcalf.

Nursing Curriculum

Any student who is interested in nursing as a career is encouraged to consider the *Nursing* curriculum. It affords opportunity for examinations for registration as a nurse and enables the student also to secure a college degree. The breadth of training beyond that usually received in a hospital training school is increasingly in demand, particularly for those who aspire to executive or supervisory positions. The curriculum (see page 105) prepares for nursing and also permits the student some specialization in other fields related to nursing.

The student must satisfactorily complete three years of work (a minimum of 96 credits) in residence at the University of New Hampshire with a minimum cumulative grade point average of 1.8, and graduate from a school

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of nursing approved by the University. The length of the training period will vary with the several schools of nursing.

A student registered in the curriculum is held for the requirements expected of students in all prescribed curricula (page 97). *This curriculum is intended to precede hospital training.*

Students interested in selecting the *Nursing* curriculum are advised to consult with the supervisor, Professor Edythe T. Richardson.

Occupational Therapy Curriculum

An ally to the medical profession, occupational therapy is any activity, mental or physical, prescribed by a physician and administered by a registered therapist to aid in the recovery or the rehabilitation of the patient.

The successful practice of occupational therapy requires not only thorough academic preparation but also suitable personality combined with judgment, dependability, tact, tolerance, patience, and will to serve. A high degree of mental and physical health is essential. Occupational therapy requires physical vitality and emotional stability.

The course admits both men and women who can meet entrance requirements.

Before the beginning of the sophomore year, in the case of freshman students who are interested in the Occupational Therapy curriculum (or before admission into this curriculum in the case of students who transfer from other majors or from other colleges), a series of tests will be given to assist the supervisor in advising the student of his or her fitness for entering this curriculum. The curriculum is outlined on page 106.

Because of the highly specialized nature of the Occupational Therapy curriculum, students are advised to enter this program not later than the beginning of their sophomore year; otherwise, they should expect to spend additional time in working toward the Bachelor of Science degree. Students seeking to transfer to the University of New Hampshire from other accredited collegiate institutions must arrange an appointment with the supervisor of the curriculum or the Department Chairman prior to admission to the curriculum in order that the applicant may be fully aware of the problems involved in completing the requirements for the degree.

The curriculum in *Occupational Therapy* is designed to satisfy the requirements of the American Medical Association as well as to offer a four-year course leading to the Bachelor of Science degree. This includes the theoretical subjects needed in the medical fields as well as a wide range of crafts and skills used in therapy and recreational, educational, and pre-professional subjects.

It is recommended that the student interested in the *Occupational Therapy* curriculum spend one summer in an occupational therapy department in either a hospital or a children's camp. This should be done before the student enters the clinical affiliation program.

At the completion of the requirements of the curriculum, the student will spend a minimum of ten months in student affiliation in approved hospitals or services under the direction of a registered occupational therapist. *When this internship is satisfactorily completed, the student is entitled to a Certificate of Occupational Therapy.* The student is then qualified to take examination for registry in the American Occupational Therapy Association. The standard examination is sent out by the Association and administered by the University. A fee of \$15 is required by the Association for each

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examination. While the present demand for qualified therapists is far in excess of the supply, there are relatively few job opportunities for those who have not completed the requirements for and entered the Registry of the American Occupational Therapy Association.

A student affiliation fee of \$95 for residents of New England and \$200 for non-residents of New England is payable to the University by those students who enter the clinical affiliation program.

Ten months of student affiliation in approved hospitals is divided as follows:

- General Medicine and Surgery — one or two months
- Pediatrics — one or two months
- Psychiatry — three or four months
- Tuberculosis — one or two months
- Physical Disabilities (surgical, neuromuscular and orthopedic)
— two or three months

The American Medical Association requires a physical examination including a tuberculin test prior to hospital affiliation.

Expenses vary during the period of student affiliation. Room, board, and laundry are given students by some hospitals; meals only in other hospitals; while some offer affiliation only. *In all cases, the University must approve living arrangements for student affiliates.* Students will furnish regulation uniforms which are required for student affiliation.

Students who are registered in the curriculum are held for the requirements expected of students in all prescribed curricula (page 97), and in addition must obtain grades of C or better in the following courses: Zoology 17, 18, 19, 20, 64; Occupational Therapy 41, 42, (44), 46, (49), (50). Students interested in the curriculum are advised to consult with the supervisor of the program or the Chairman of the Department.

Pre-Medical Curriculum

Young men and women who are interested in careers as physicians or surgeons may select the *Pre-Medical* curriculum. Students who successfully complete this curriculum will be eligible for admission to Class A medical schools. However, owing to the large number of applicants for admission to medical schools, usually only those students who stand in the upper third of their class can expect to be admitted.

It is highly desirable that a pre-medical student secure a bachelor's degree, although some medical schools do not require it as a condition of admission. The four years of pre-medical work will not only give the student a foundation for his future medical training, but will also give him an opportunity to secure a broad general education.

The curriculum is outlined in detail on page 108. Students registered in it are held for the general requirements of prescribed curricula (page 97).

Students pursuing the Pre-Medical curriculum must obtain a grade point average of 2.5 or better for the required courses in Biology, Chemistry, Physics, and Zoology.

Students who are interested in this curriculum should consult with the supervisor, Professor Paul E. Schaefer.

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Secretarial Curriculum

A large number of college women find pleasant and profitable employment in secretarial positions in private, professional, commercial, and industrial offices. Although in most cases the initial appointment is to a subordinate position in an office organization, the breadth of the college education plus the secretarial skills acquired during the college course give opportunity for early assumption of greater responsibility.

Although the curriculum is essentially semi-professional, it provides for a rather liberal number of electives with which to secure the general education so essential to success.

Women students who are interested in other aspects of business are advised to consider the *Business* curriculum and those interested in less specialization are counseled to consider a major in *Economics* in the General Liberal Arts curriculum.

Women who are preparing to teach commercial subjects in high school should consult the description of the *Commercial Teacher Preparation* program which appears on page 90.

The *Secretarial* curriculum is outlined in detail on page 109. Secretarial students must earn grades of C or better in the following courses: Secretarial Studies 3-4, 9-10, 17; Secretarial Studies 11, 13, 18 (unless excused in accordance with the statement below). In addition, secretarial students must earn at least a C grade in 4-11 credits (to make a total of 24 semester credits) of work in the following courses: Secretarial Studies 22, *Advanced Transcription*; Secretarial Studies 23-24, *Business Writing*; Economics 3, *Economic and Commercial Development of the U. S.*; Business Administration 1-2, *Elementary Accounting*; Business Administration 21-22, *Commercial Law*; or Business Administration 24; *Introduction to Business*.

Students transferring from collegiate institutions and high-school students with previous training in secretarial subjects are required to take the following courses: Secretarial Studies 3-4, 9-10, 17; Secretarial Studies 11, 13, 18 (unless excused). These students may be excused from:

Secretarial Studies 11 by passing a 40-period certificate test.

Secretarial Studies 13 by passing a theory and practice test on each of the machines taught.

Secretarial Studies 18 by giving satisfactory evidence of having done acceptable secretarial work in a business office for one year. "One year" shall be interpreted as not less than 50 weeks of full-time work. Full-time work done continuously for two weeks or more may be counted toward a year's work. Part-time work of less than 30 hours a week may not be considered. Only part-time work of 30 hours a week or more done continuously for at least 6 weeks may be counted toward a year's full-time work. The number of hours of acceptable part-time work will be divided by 40 to find the equivalent number of weeks of full-time work. (*Work done for relatives will not be considered.*)

Transfer and high school students who have had one year of Gregg shorthand (or the equivalent of one year) in another institution and have earned a grade of 80 or better (where the passing grade is 70) will not be allowed to enroll in Secretarial Studies 1 for credit; likewise, those students who have had one year of typewriting (or the equivalent) in another institution and have earned a grade of 80 or better (where the passing grade is 70)

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will not be allowed to enroll in Secretarial Studies 7 for credit (see below).

Secretarial students who have had Secretarial Studies 5 at the University of New Hampshire or a similar course in another collegiate institution, or one semester of typewriting in high school or preparatory school, will be required to enter Secretarial Studies 27 instead of Secretarial Studies 7.

Students registered in this curriculum are held for the general requirements expected of students in all prescribed curricula (page 97). Students interested in registering for the *Secretarial* curriculum should consult with Professor Doris E. Tyrrell.

Social Service Curriculum

Social Service includes, among others, the following fields: family case work, child care, child placement, settlement and neighborhood house, institutional work for defectives and dependents, state and local welfare work, probation, correctional school and prison service, Y.M.C.A. and Y.W.C.A. service, municipal playground direction, child guidance clinics, community chest work.

For full recognition in social service, it is important for a man or woman to have completed the two-year professional course in a graduate school of social work. The best preparation for admission to such a graduate school is either a broad liberal arts education with 40 to 60 hours of credit in the social sciences, including a major in *Sociology*, or the *Social Service* curriculum. For able students, scholarship aid toward meeting expenses of graduate study is sometimes available.

There is a continuing serious shortage of qualified workers in nearly all the branches of social work. For this reason, a number of students who complete the *Social Service* curriculum find employment each year, in public welfare group work, etc., before they commit themselves to graduate study. The program is outlined in detail on page 111. Students registered in it are held to the general requirements of all prescribed curricula (page 97) and in addition must obtain a grade of C or better in 24 semester hour credits from the following courses: Sociology 27, 44, 71, 72, 73, 74, 75, 76, and 97.

Students interested are advised to consult with Professor Richard S. Dewey, Chairman of the Department of Sociology.

PREPARATION FOR TEACHING

The University of New Hampshire offers two types of teacher preparation programs at the undergraduate level. General Liberal Arts curriculum students may follow an advisory program of studies called the *University Teacher Preparation* program. A student following this program takes Education 41 in the sophomore year. In the junior year he takes Education 57, 58. Before admission to Education 57 he must pass a selection process set up for teacher preparation candidates. In the first semester of the senior year he takes Education 59 and an Education 91 course in the field of his major teaching interest. The second semester is devoted to practice teaching.

There are also Prescribed curricula preparing teachers in the fields of Agriculture, Art, Home Economics, Music, and Physical Education. (See following pages.) *This section of the catalogue includes descriptions of teacher preparation programs offered by all departments of the University, not merely those offered by departments in the College of Liberal Arts.*

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Accreditation

The teacher preparation programs of the University are accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary teachers, secondary teachers, and school service personnel, with the master's degree as the highest degree approved.

Courses in Problems in the Teaching of High-School Subjects

The courses in problems in the teaching of high-school subjects, listed under Education, are open only to students who have completed the course *Principles of Teaching*, Education 58, in addition to the courses in the subject and related subjects designated as prerequisites.* From these courses in Problems in the Teaching of High-School Subjects the student who plans to complete the *University Teacher Preparation* curriculum selects his course in the field of his teaching major. *To be eligible for Supervised Teaching in a subject, the student must complete the course in the problems of teaching that subject with a grade of at least C.*

Courses in Supervised Training

The work in Supervised Teaching is under the direction of the Coordinators of Student Teaching. Students teach under the immediate direction of selected classroom teachers in schools approved by the University.

In the Supervised Teaching courses the student participates in the conduct of class exercises and in the control of the classroom, at first chiefly as an observer, but gradually entering into teacher responsibilities until complete charge of the classroom is assumed.

This work is required in the University Teacher Preparation programs, but will be open only to students whose applications are approved by the Chairman of the Department of Education and the Coordinators of Student Teaching in the subject or subjects in which the applicant desires to do supervised teaching. *Applications should be filed in the office of the Department of Education on or before November 15 of the academic year in which the supervised teaching is to be done. No application will be considered unless the applicant has completed with a grade of at least C the following courses in Education: 41, 57, 58, 59, and has superior grades in at least 18 semester credits in the subject matter field in which he desires to teach under supervision.*

The applicant must also complete with a grade of at least C a course in the problems of teaching the subject in which he desires to do supervised teaching.

Guidance of Students Preparing to Teach

Students who come to the University of New Hampshire for the purpose of preparing themselves for the teaching profession should consult with Professor Everett B. Sackett, Chairman of the Department of Education, in their freshman year. Other students who are seriously considering teaching as a possible profession are urged to consult him before making a decision.

* Except for Agriculture-Education 92, Home Economics-Education 91, and Physical Education-Education 91.

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Completion of the approved teacher preparation programs of the University qualify a student for certification as a teacher in a growing number of states. There are others which have unusual requirements for certification. Professor Sackett will be glad to advise students regarding these requirements.

PRESCRIBED CURRICULA IN TEACHING PREPARATION

Agriculture Teacher Preparation Curriculum

A student electing the Teacher Preparation curriculum in Agriculture must meet the general and specific requirements for a degree described on pages 42 and 43 applicable to all students registered in the College of Agriculture. His course of study will follow a broad general program rather than a specialization in any particular field. Furthermore, he must meet the state requirements for certification which include one semester of practice teaching, 14 additional credits of courses in Education, and 8 credits of Agricultural Engineering. In addition he must have had a farm upbringing prior to enrolling in the Teacher Preparation curriculum in Agriculture, or two years of agricultural experience, one year of which must have been continuous in a standard commercial farm enterprise.

Local school boards are beginning to appreciate more fully the value of instruction in agriculture, both for the boys who will engage in agriculture after leaving high school, and as electives to maintain the interest of those young men who may wish to take at the University further education in this basic industry. As a result, there are a good many positions open for young men who wish to make the teaching of agriculture their profession.

Art Education Curriculum

This curriculum is designed to prepare teachers and supervisors of art in the public schools. It is based upon the new demands for teachers who possess developed skills in the arts and a broad general culture in addition to a specialized preparation in Art Education. The satisfactory completion of the curriculum will satisfy the initial certification requirements for teachers of art in the public schools in New Hampshire and in other states maintaining certification requirements.

Freshmen who plan to enter this curriculum should elect Arts 23-24, *Basic Design and Drawing and Design*, in their first-year program.

A grade of C or better must be achieved in all Arts courses required in the curriculum.

Students who wish to prepare themselves to teach other subjects in addition to art can do so by using their elective hours for this purpose. Such a program should be worked out in consultation with Professor Everett B. Sackett of the Department of Education.

Students registered in the curriculum (see page 112) are held for the general requirements expected of students in all prescribed curricula (see page 97).

Students seeking to transfer to the University of New Hampshire from other accredited collegiate institutions must arrange an appointment with the supervisor of the curriculum or the Department Chairman prior to admission to the curriculum in order that the applicant may be fully aware of the problems involved in completing the requirements for the degree.

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Interested students should consult with the supervisor, Professor George R. Thomas.

Commercial Teacher Preparation Program

This program is an option in the Prescribed Secretarial curriculum and is not a Prescribed curriculum in itself.

Students preparing to teach commercial subjects in high school should include in their freshman programs Secretarial Studies 7-8 and electives from Group III; in their sophomore programs, Secretarial Studies 1-2, Business Administration 1-2, and 24, Economics 3, Education 41, and an elective from Group I; in their junior programs, Secretarial Studies 3-4, 9-10, 13, and 23-24, Business Administration 21-22 and Education 57 and 58; in the Summer Session between their junior and senior years, Commercial Subjects-Education 91, *Problems in the Teaching of Commercial Subjects in the High School*. Such students should enroll for 18 semester credits in at least one semester in order to have the second semester of the senior year free for supervised teaching.

Interested students should consult with the supervisor, Professor Doris E. Tyrrell.

Home Economics Education

This curriculum is designed to prepare teachers of home economics for the secondary education program. See page 60 for the program outlined for Home Economics Education. Satisfactory completion of this curriculum will meet the certification requirements for teachers of home economics in the public schools of New Hampshire and in several other states having certification requirements.

Students who are interested should consult with the Chairman of the Department of Home Economics.

Music Education Curriculum

This curriculum is designed to prepare teachers of music for the public schools. It is based on the new demands for teachers possessing sound musicianship and a broad general culture in addition to a specialized preparation in music education. This program is fully accredited by the State Department of Education and complies with standards set up for certification of teachers and supervisors of music in most states. Training for teaching in both the elementary and secondary schools is included in the program. The Department is also actively affiliated with the Music Educators National Conference.

To be admitted to this curriculum the student must give evidence of having a sound musical background. *Freshmen who plan to enter this curriculum must elect Music 9-10 and four hours of Applied Music in their first year program.*

A grade of C or better must be achieved in all music and education courses required in the curriculum.

Public school music teachers must maintain a satisfactory standing musically with other professional musicians in the community and should be able to play or sing acceptably. For this reason, *16 semester credits in Applied Music are required before graduation.* Students will be encouraged

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to accumulate up to eight semester credits in one instrument or in voice. In addition, all candidates are required to meet minimum standards of performance in piano, voice, a woodwind instrument, a brass instrument, a string instrument, and percussion. Candidates are expected to meet the piano and voice requirements by the end of their junior years. The minimum instrumental standards may be met by special examination, or may be demonstrated during the time the candidate is registered for Applied Music in these instruments. Details of minimum standards of performance may be obtained from the Supervisor of the Music Education curriculum.

Recitals. Students enrolled in the *Music-Education* curriculum must accumulate a minimum of 24 points in the sophomore, junior, and senior years. Attendance at each concert or recital constitutes one point.

The curriculum is outlined in detail on page 114. Students who are interested should consult with the supervisor, Professor John B. Whitlock.

Physical Education Teacher Preparation Curriculum (Men)

This curriculum is for men students who plan to prepare themselves for positions as teachers of physical education, teachers of physical education and coaches of athletic teams, or teachers in two subject-matter fields and coaches of athletic teams in secondary schools (see page 116). *It is open to men who have satisfactorily completed the freshman year, and are approved by the Department of Physical Education for Men for admission to Physical Education as a field of concentration.* A grade of C or better must be achieved in Physical Education 23, *Principles of Physical Education*; Physical Education 61, *Problems of Teaching in Physical Education*; Physical Education 65, *Administration of Physical Education in Secondary Schools*; and in 24 semester credits in the second teaching major.

This curriculum requires the satisfactory completion of a second teaching major of 24 semester credits and a teaching minor of 12 semester credits in subjects taught in high school. Students registered in this curriculum are held for the general requirements expected of students in all prescribed curricula (page 97). Students who are interested in this program should consult with the supervisor, Professor Carl Lundholm.

Physical Education Teacher Preparation Curriculum (Women)

For women students who plan to prepare themselves for positions as teachers of physical education or for positions in recreation education, the University has organized the Physical Education Teacher Preparation curriculum for Women (see page 118). This curriculum will enable women to elect, at the end of the sophomore year, the *Physical Education* option or the *Recreation Education* option. Furthermore, students have the opportunity, if they so desire, to prepare themselves to teach in a subject matter field as well as in physical education. The curriculum is open to women who have satisfactorily completed the freshman year and are approved by the Department of Physical Education for Women for admission to that field of concentration. It provides an opportunity for students to teach physical education and to assist in recreation programs, under supervision, in nearby schools and recreation centers.

Any student in this curriculum who is planning to teach in areas in addition to physical education must complete with an average grade of C or better a second teaching major of 18 semester credits in subjects taught in high schools.

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For students choosing the *Physical Education* option, the following courses offered by other departments are suggested as valuable electives: Arts 4, *Crafts*; Bacteriology 5, *Public Health and Sanitation*; Speech 15, *Public Speaking*; Home Economics 84, *Personal, Family, and Community Health*; Humanities 1-2, *Humanities*; Music 37-38, *Introduction to Music Literature*; Psychology 37, *Developmental Psychology*; Psychology 47, *Mental Hygiene*; Sociology 1, *Introductory Sociology*; Sociology 43, *Urban Sociology*. Physical Education 24, *Organized Camping*, is also recommended. Students in this curriculum are advised to choose non-professional electives whenever possible. Those planning to enter graduate study should elect a foreign language.

In the Physical Education option a grade of C or better must be achieved in 24 semester credits in the Physical Education courses required by the curriculum. A minimum of one summer as a camp counselor or playground leader is highly recommended for students choosing the *Physical Education* option.

Students choosing the *Recreation Education* option are advised to become skilled in at least two of these five fields: art, drama, music, outdoor education, or physical education. The following courses offered by other departments are suggested as valuable electives for recreation specialists: Arts; Speech 15, *Public Speaking*; Government 6, *Principles of American Government*; Music 23, *Piano*; Music-Education 90, *Problems in the Teaching of Elementary School Music*; Psychology 47, *Mental Hygiene*; Psychology 63, *Differential Psychology*; Sociology 33, *Cultural Anthropology*. Physical Education 56, *Health Education*, and Physical Education 63, 64, *Theory of Team Sports*, are also recommended.

Recreation Education students desiring a major emphasis in Forestry Recreation and outdoor education are advised to take Forestry 61, 62, *Problems*. Those interested in a major emphasis in Hospital Recreation are advised to take Zoology 19, *Kinesiology*, and Physical Education 55, *Remedial Gymnastics*.

To make certain that the *Recreation Education* option contains some experience under working conditions, each student is required to secure during a summer before graduation a minimum of 8 points in actual leadership of recreational activities in such places as community centers, hotels, playgrounds, and camps where supervision will be authorized. A record of such activities will be kept by the student and submitted to the supervisor of the curriculum for crediting. Each week will constitute 1 point.

The students in the Recreation Education option must complete, with a grade of C or better, 24 semester credits in the physical education, arts, music, outdoor education, and drama courses offered by the curriculum.

Under Physical Education 1, 2, 3, 13, 14, 5, 6, Physical Education curriculum students are required to include certain activities, in many cases in sections especially reserved for them. *During the freshman year* the student must register for one quarter each of the following, preferably in the order listed: fundamentals, tennis, badminton, skiing, lacrosse (and swimming, basketball, and volleyball if they have not had them previously); in the *sophomore year*, tennis (int.), hockey, stunts and tumbling, figure skating, elementary games, skiing (int.), dance survey, outdoor education and archery; in the *junior year*, golf, folk and square dancing, modern dance (elem.), and modern dance (int.). In addition, apparatus and gymnastics should be taken in the senior year.

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For those who are highly skilled in the activities mentioned and for *Recreation Education* majors, substitutions are made with the approval of the supervisor. (For example, practice leadership and American country dance are required in the *Recreation* option.) Further dance and other activities not listed are included in courses for students in the Prescribed curriculum.

Students who are following any teacher preparation curriculum in the University are urged to include for Physical Education: American country dancing, folk dancing, recreation workshop, hockey, basketball, volleyball, and softball.

Students registered in this curriculum are held for the general requirements expected of students in all prescribed curricula (see page 97). The curriculum is outlined on page 118. For further information concerning this curriculum consult with the supervisor, Professor Marion C. Beckwith.

A PLAN FOR INDEPENDENT STUDY

In order to stimulate the superior student and to develop his initiative, the Faculty of the College has approved a plan for independent study which will permit *seniors who have demonstrated superior ability* to take a special program replacing in part courses usually taken in the senior year. Independent study enables a student to *pursue intensive work in a limited field of study or to integrate the subject matter of two or more fields.*

(1) A senior in the College of Liberal Arts may register for not less than 6 or more than a total of 12 semester credits of *Independent Study* for the year, provided: (a) his cumulative academic average at the end of his junior year is 3.0 or better, and (b) he has submitted a plan for Independent Study that has been approved by his supervisor and the Dean.

(2) *This student shall be called a College Scholar.*

(3) A College Scholar may not carry more than 18 credits per semester and is not relieved of any University, College, or Prescribed curriculum requirements. Independent Study credits may, at the discretion of the supervisor, be submitted in whole or in part for major course requirements in the *General Liberal Arts* curriculum or for elective credits in a *Prescribed* curriculum.

(4) A College Scholar will be assigned for guidance to a member of the staff of his major department or Prescribed curriculum.

(5) A College Scholar may either (a) work upon a project involving individual work, such as a long essay, a series of experiments, gathering and interpretation of data, creative writing, etc., or (b) prepare for a special comprehensive examination. (*Such special comprehensive examination or paper may not be substituted for a required departmental comprehensive examination or paper.*)

(6) The results of a College Scholar's activity under the program of Independent Study will be judged by three members of the Faculty, appointed by his supervisor from the staff of his department or curriculum or from related departments or curricula or from both.

A PLAN FOR TWO BACHELORS DEGREES IN FIVE YEARS

It is possible for competent students to choose courses that will satisfy the requirements for baccalaureate degrees in both the College of Liberal Arts and the College of Technology within a five-year period. Anyone interested should confer with the deans of both Colleges as early in his academic career as possible, and, if approved for the dual program, should expect to work closely with advisers for both Colleges.

THE FORD FOUNDATION SCHOLARSHIP PROGRAM

A limited number of freshmen each year are selected from those who apply for a special five-year program leading to the B.A. and M.A. degrees. The program is limited to superior students who expect that their chosen vocation shall be teaching at the college level. The regular General Liberal Arts requirements for the B.A. degree and the Graduate School requirements for the M.A. degree are basic requirements. In addition the student is expected to attend special seminars, incorporate a minor area of study as well as a major, complete special work in mathematics, languages, reading, and writing. During the last three years of the program, he will be assigned to his major department as an intern in teaching.

Prospective freshmen with superior high school records who are interested in this program should consult the principal or counselor in their high schools or write to the Director of Admissions at the University for more information.

REQUIREMENTS FOR DEGREES

The degree of **Bachelor of Science** is conferred upon those students in the College of Liberal Arts who successfully complete the requirements of a *Prescribed* curriculum. The degree of **Bachelor of Arts** is conferred upon all students in the College of Liberal Arts who successfully complete the requirements of the *General Liberal Arts* curriculum.

A student's candidacy for a degree will be determined by his having satisfied the University, College, major, or curriculum requirements in force at the time of his admission to the College either as a beginning student or as a transfer. A student may petition to satisfy the University, College, major, or curriculum requirements that may be in force at any time during his residence. Such a student shall be held, however, for *all* the academic requirements of the catalogue under which he seeks a degree; not a portion thereof. *The new catalogue becomes effective on July 1 of each year.*

Each candidate for a degree in the College of Liberal Arts must complete successfully 128 semester credits and achieve a 1.8 *grade point average* in all courses completed in the University. In addition, he must complete the requirements given below and those of the major field, or *Prescribed* curriculum, as stated in the preceding pages.

A. General University Requirements

Physical Education for men	Freshman year
Physical Education for women	Freshman, sophomore, and junior years
R.O.T.C. for men	Freshman and sophomore years

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B. General College Requirements

1. SPECIAL REQUIREMENTS OF THE FRESHMAN YEAR

(If not completed in the freshman year, they must be taken as soon as available.)

*a. English 1-2, *Freshman English*

*b. A biological science (Biology 1-2; or 3) or a physical science (Chemistry 1-2†; 3-4; or 5-6; Geology 1-2; Mathematics (2), (3); or 7-8; Physical Science 1-2; Physics 1-2‡).

2. SPECIAL HISTORY REQUIREMENT (to be taken in the freshman year except for those students who are registered for the freshman program of the Medical Technology curriculum)

*History 1, 2, *Introduction to Contemporary Civilization*

3. All freshmen in the College of Liberal Arts are assigned on registration to advisers who counsel them until they have officially selected major departments or Prescribed curricula. Official declaration of a major or a prescribed curriculum is accomplished by a special form which must bear both the adviser's and the supervisor's signature.

4. Students in both the *General Liberal Arts* curriculum and *Prescribed* curricula are advised against over-specialization. Although no attempt is made to limit by regulation the number of courses in a major or the professional courses in a Prescribed curriculum, more than 36 semester credits in courses in the major department, or more than 66 semester credits in professional courses in a Prescribed curriculum, constitute excessive concentration and the supervisor or Dean of the College may not approve schedules that reveal over-specialization.

5. Students are advised that a limited amount of credit earned in music organizations may be counted toward a degree. (See Music Organizations and speech and drama courses in Debate Practice and Theater Practice in the Description of Courses.)

C. General Liberal Arts Curriculum Requirements

Each candidate for a degree in the *General Liberal Arts* curriculum must satisfy (1) the General University Requirements, (2) the General College Requirements listed below and those of the major as described in preceding pages.

1. SPECIAL LANGUAGE REQUIREMENT

Prior to July, 1961, all students who pursued the *General Liberal Arts* curriculum were required to pass a test of reading ability in one of the following languages: Classical Greek, French, German, Italian, Latin, Russian, or Spanish. Students pursuing the *General*

* Not counted toward fulfillment of Major or Group requirements.

† Chemistry 1-2 does not fulfill the requirement for pre-medical students or Biology majors nor the prerequisite for further courses in Chemistry.

‡ Students who expect to major in Physics should not register for Physics 1-2, but should elect Mathematics 21-22, and Physics 18, to be able to schedule Mathematics 23, 24, and Physics 23-24 in the sophomore years. (See description of Physics major page 77.)

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Liberal Arts curriculum after July, 1961, are required to pass a test of general competence in one of the languages mentioned above. The test is based on the achievement of students after completion of beginning courses in languages at the University of New Hampshire (French 1, Spanish 1, German 1-2, Russian 1-2, Latin 1-2, Greek 1-2, Italian 1-2). Usually two to three years of high school work are adequate preparation for this test. This examination will consist of an oral-aural test as well as a comprehensive written examination and will test the student's ability to comprehend and read texts of moderate difficulty and answer questions based on that text.

A student may also complete his college requirement by passing one of the following courses: French 1, Spanish 1, German 2, Russian 2, Latin 2, Greek 2, Italian 2, and Latin 2, or any language course numbered higher.

In the event a student does not pass the competence examination he must make a written application for permission to repeat the examination showing that he has improved his preparation through completion of a course or through tutoring or supervised study. Application forms are available in the office of the Department of Languages.

The competence tests are normally given three times a year: during Orientation week, on the last week of classes in May, and at the end of the Summer Session.

Those graduating in February, who have not previously passed the examination, may take it at the end of January by petition.

2. **GROUP REQUIREMENTS.** (*It is expected that these requirements will normally be completed by the end of the sophomore year.*)

A student whose major is included in Groups I, II, or III shall present for the satisfaction of that group requirement some course outside of his major field. *A student may not offer in fulfillment of the Group I requirement the elementary course in the language in which he satisfies the special language requirement.*

- I. A student must successfully complete a year's work (two sequential semesters) in this group.
 - a. Arts 31, 32
 - b. English 13, 14, or 15, 16
 - c. Humanities 1-2
 - d. Languages
 - e. Music 37-38
 - f. Philosophy 1, 2
- II. A student must successfully complete a year's work (two sequential semesters) in this group (students electing a biological science during their freshman year must elect a physical science during their sophomore year, or *vice versa*):
 - a. Biological Science (Biology 1-2 or 3)
 - b. Physical Science (Chemistry 1-2; 3-4; or 5-6; Geology 1-2; Mathematics (2), (3); or 7-8; Physical Science 1-2; Physics 1-2.

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III. A student must successfully complete at least 6 semester credits of course work in this group.

- a. Economics
- b. Government
- c. Psychology
- d. Sociology

3. DIVISIONAL REQUIREMENTS

The student must meet such divisional requirements as may be established in the division in which he is majoring.

4. MAJOR REQUIREMENTS

Each student pursuing the *General Liberal Arts* curriculum may select at the end of the second semester of the freshman year, and shall select not later than the end of the second semester of the sophomore year, a major department in which he shall pass courses to a total of 24 semester credits with grades of C or better. Courses in other departments closely related to the major courses may be counted with the consent of the major supervisor and the College Dean. Departments shall designate in the catalogue in their description of courses those which will not count for major credit. In addition to satisfactorily completing (1) 24 semester credits in the major field and (2) the divisional requirements, each student, at the discretion of his major department, may be required to:

- a. Pass a comprehensive examination in his major field
or
- b. Prepare a satisfactory paper, on a subject approved by his supervisor, in the student's field of concentration.

D. Prescribed Curriculum Requirements

1. A student registered in a Prescribed curriculum must satisfy the General University Requirements and the General College Requirements described in previous pages.
2. *Inasmuch as all Prescribed curricula are intended to furnish professional or semi-professional preparation, students selecting them are held for the successful completion of all the courses prescribed and generally in the sequence in which they are arranged in the curriculum.*
3. A student pursuing a Prescribed curriculum must meet the quality requirements established for that curriculum. (See descriptions of the curricula on preceding pages.)

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GENERAL LIBERAL ARTS CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
R.O.T.C.	1½	1½
P. E. 1, 2 (<i>women</i>)	1	1
P. E. 31, 32 (<i>men</i>)	½	½
Hist. 1, 2, <i>Introduction to Contemporary Civilization</i>	3	3
*A Biological Science (<i>Biol. 1-2; or 3</i>) or a Physical Science (<i>Chem. 1-2†; Chem. 3-4; or 5-6; Geol. 1-2; Math. (2), (3); or 7-8; Ph. Sci. 1-2; or Phys. 1-2‡</i>)	3, 4, or 6	3, 4, or 6
Engl. 1-2, <i>Freshman English</i>	3	3
§Electives to meet semester requirements		
	16	16
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
P. E. 3, 4, (<i>women</i>)	1	1
Elect one year's work from each of the three following groups (see group requirements, page 87):		
Group I. Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2	3	3
Group II. *A Biological Science (<i>Biol. 1-2; or 3</i>) or a Physical Science (<i>Chem. 1-2; 3-4; or 5-6; Geol. 1-2; Math. (2), (3); or 7-8; Ph. Sci. 1-2; Phys. 1-2‡</i>)	3 or 4	3 or 4
Group III. Economics, Government, Psychology, Sociology	3	3
Electives to meet semester requirements		
	16	16
JUNIOR YEAR		
P. E. 5, 6 (<i>women</i>)	1	1
Major courses and electives to meet semester requirements		
	16	16

* Students electing a Biological Science during their freshman year must elect a Physical Science during their sophomore year, or *vice versa*.

† Chemistry 1-2 does not fulfill the requirement for pre-medical students or Biology majors nor the prerequisite for further courses in Chemistry.

‡ Students who expect to major in Physics should not register for Physics 1-2, but should elect Mathematics 21-22, and Physics 18, to be able to schedule Mathematics 23-24, and Physics 23-24 in the sophomore year. (See description of Physics major page 77.)

§ See Special Language Requirements, page 95.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 95.

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SENIOR YEAR

Major courses and electives to meet semester requirements

16

16

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BUSINESS CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
*See freshman requirements, page 95.		
B. A. 1-2, <i>Elementary Accounting</i>	3	3
	16	16
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
P. E. 3, 4, (women)	1	1
Econ. 1-2, <i>Principles of Economics</i>	3	3
Elective from Group I	3	3
Elective from Group III	3	3
Group I.—A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Hu- manities 1-2; Languages; Music 37-38; Philosophy 1, 2		
Group III.—Six semester credits from Government; History; Psychology; Sociology		
	16	16
JUNIOR YEAR		
P. E. 5, 6 (women)	1	1
B. A. 21-22, <i>Commercial Law</i>	3	3
B. A. 23, <i>Business Communications</i>	3	
Econ. 25, <i>Marketing</i>	3	
Econ. 51, <i>Labor Economics</i>	3	
Electives from Economics and Business Administra- tion	3	3
Sp. (15), <i>Public Speaking</i>		3
Electives		
	16	16
SENIOR YEAR		
B. A. 34, <i>Business Management</i>		3
Econ. 31, <i>Economics and Business Statistics</i>	3	
Econ. 53, <i>Money and Banking</i>	3	
Econ. 56, <i>Corporation Finance</i>		3
Electives		
	16	16

* Students offering one or more units of Physical Science for admission are advised to elect Biol. 1-2; or 3. Students offering one or more units of Biological Science for admission are advised to elect Physical Science.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 81.

COLLEGE OF LIBERAL ARTS

BUSINESS CURRICULUM (Accounting Option)

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
See freshman requirements, page 95.		
B. A. 1-2, <i>Elementary Accounting</i>	3	3
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
P. E. 3, 4 (<i>women</i>)	1	1
B. A. 3-4, <i>Intermediate Accounting</i>	3	3
Econ. 1-2, <i>Principles of Economics</i>	3	3
Elective from Group I	3	3
	16	16
<i>Group I.</i> —A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Phi- losophy 1, 2		
JUNIOR YEAR		
P. E. 5, 6, (<i>women</i>)	1	1
B. A. 7-8, <i>Cost Accounting</i>	3	3
B. A. 21-22, <i>Commercial Law</i>	3	3
B. A. 23, <i>Business Communications</i>	3	
Econ. 25, <i>Marketing</i>	3	
Econ. 56, <i>Corporation Finance</i>		3
Sp. (15), <i>Public Speaking</i>		3
Electives from Group III	3	3
Electives		
	16	16
<i>Group III.</i> —Six semester credits from Government; History; Psychology; Sociology		
SENIOR YEAR		
B. A. 55, <i>Advanced Accounting</i>	3	
B. A. 56, <i>Federal Tax Accounting</i>		3
B. A. 57, <i>Auditing</i>	3	
B. A. 61, <i>Analysis of Financial Statements</i>	3	
B. A. 68, <i>Personnel Administration</i>		3
Econ. 31, <i>Economics and Business Statistics</i>	3	
Econ. 53, <i>Money and Banking</i>	3	
Electives		
	16	16

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 81.

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HOTEL ADMINISTRATION CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95.		
Chem. 1-2, <i>General Chemistry</i>	4	4
H. Ad. 1, <i>Introduction to Hotel Management</i>	1	
H. Ad. 40, <i>Lectures on Hotel Administration</i>		1½
H. Ec. 18, <i>Principles of Food Selection and Preparation</i>		3
Psych. 1, <i>General Psychology</i>	3	
Electives		
	16	16

SOPHOMORE YEAR

R.O.T.C.	1½	1½
B. A. 1-2, <i>Principles of Accounting</i>	3	3
Econ. 1-2, <i>Principles of Economics</i>	3	3
H. Ad. 42, <i>Lectures on Hotel Administration</i>		½
H. Ec. 51-52, <i>Quantity Foods and Purchasing</i>	3	3
Sp. 15, <i>Public Speaking</i>	3	
Elective from Group I	3	3
Electives		
	16	16

Group I.—A year's work (two sequential semesters)
from Arts 31, 32; English 13, 14; or 15, 16;
Humanities 1-2; Languages; Music 37-38; Phil-
osophy 1, 2

JUNIOR YEAR

Arts 20, <i>Drafting and Space Planning</i>		3
B. A. 9-10, <i>Hotel and Restaurant Accounting and Control Systems</i>	3	3
B. A. 23, <i>Business Communication</i>	3	
H. Ad. 44, <i>Lectures on Hotel Administration</i>		½
H. Ad. 55, <i>Hotel Operation</i>	3	
H. Ad. 56, <i>Hotel Engineering Problems</i>		3
M. E. 40, <i>Heating and Ventilating</i>		3
Electives from Group III	3	3
Electives		
	16	16

Group III.—Six semester credits from Government;
History; Sociology

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SENIOR YEAR

H. Ad. 46, <i>Lectures on Hotel Administration</i>		1½
H. Ad. 66, <i>Hotel Promotion and Sales</i>		3
H. Ad. 67, <i>Stewarding and Catering</i>	3	
H. Ad. 68, <i>Personnel and Labor Relations in Hotels and Restaurants</i>		3
H. Ec. 46, <i>Institutional Textiles</i>		3
Electives		
	16	16

PRACTICAL EXPERIENCE. To be eligible for graduation a student must have had two summer practicums or satisfy the Department that equivalent experience has been completed.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 82.

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MEDICAL TECHNOLOGY CURRICULUM

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
See freshman requirements, page 95. (Include Biology 1-2; or 3 and Chemistry 3-4.)		
Math. (2), (3), <i>Algebra, Trigonometry</i>	3	3
or		
Math. 7-8, <i>Fundamental Mathematics</i>		
Electives		
	16	16
SOPHOMORE YEAR		
P. E. 3, 4, (<i>women</i>)	1	1
Bact. 1, <i>General Bacteriology</i>	4	
Bact. 8, <i>Pathogenic Bacteriology</i>		4
Chem. 17, <i>Introductory Quantitative Analysis</i>	4	
Chem. (45), <i>Organic Chemistry</i>		5
Hist. 1, 2, <i>Introduction to Contemporary Civilization</i>	3	3
Elective from Group I	3	3
Electives		
	16	16
<i>Group I.</i> —A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Human- ities 1-2; Languages; Music 37-38; Philosophy 1, 2		
JUNIOR YEAR		
P. E. 5, 6, (<i>women</i>)	1	1
Bio. Ch. 56, <i>Physiological Chemistry</i>		5
Bact. 53, <i>Immunology and Serology</i>	4	
Zool. 17, <i>Human Anatomy</i>	4	
Zool. 18, <i>Human Physiology</i>		4
Elective from Group III	3	3
Electives		
	16	16
<i>Group III.</i> —Six semester credits from Government; History; Psychology; Sociology		
SENIOR YEAR		
*Biol. 61-62, <i>Clinical Laboratory Methods</i>	16	16

* This course starts about June 20 at the Mary Hitchcock Memorial Hospital School of Medical Technology and includes lecture and laboratory work in bacteriology, blood bank and serology, clinical chemistry, hematology, laboratory management and ethics, mycology, parasitology, histology, and clinical microscopy. The credits are awarded in time for graduation in June of the following year after receipt of an official transcript of the grades obtained at the School of Medical Technology and certification by the director of this school and the supervisor of the curriculum that the work has been successfully completed.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 82.

COLLEGE OF LIBERAL ARTS

NURSING CURRICULUM*

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
See freshman requirements, page 95. (Include Biology 1-2; or 3.)		
Chem. 3-4, <i>General Chemistry</i>	4	4
	16	16
SOPHOMORE YEAR		
P. E. 3, 4, (<i>women</i>)	1	1
Zool. 17, <i>Human Anatomy</i>	4	
Zool. 18, <i>Human Physiology</i>		4
Elective from Group I	3	3
	16	16
<i>Group I.</i> —A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Human- ities 1-2; Languages; Music 37-38; Philosophy 1, 2		
JUNIOR YEAR		
P. E. 5, 6, (<i>women</i>)	1	1
Bio. Ch. 1, <i>Organic and Biological Chemistry</i>	5	
Zool. 66, <i>Elements of Histology and Microtechnique</i>		4
Electives from Group III	3	3
Electives		
	16	16
<i>Group III.</i> —Six semester credits from Economics; Government; Psychology; Sociology		

TRAINING PERIOD

Credit earned in training at an approved hospital will apply toward a Bachelor's degree. The University should be informed of the training school affiliation. A transcript of the hospital record must be submitted upon completion of the training program. An application for a degree must be filed.

* This curriculum is intended to precede hospital training.

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OCCUPATIONAL THERAPY CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95. (Include Biology 1-2; or 3.)		
Arts 23, <i>Basic Design</i>	2	
Arts 24, <i>Drawing and Design</i>		2
Soc. 1, <i>Introductory Sociology</i>	3	
Electives		
	16	16

SOPHOMORE YEAR		
P. E. 3, 4, (<i>women</i>)	1	1
O. T. 41, <i>Theory of Occupational Therapy</i>	2	
Psych. 1, <i>General Psychology</i>	3	
Psych. (47), <i>Mental Hygiene</i>		3
Zool. 17, 18, <i>Human Anatomy and Human Physiology</i>	4	4
Elective from Group I	3	3
Electives from Group III	3	3
Electives		
	16	16

Group I.—A year's work (two sequential semesters)
from Arts 31, 32; English 13, 14; or 15, 16;
Humanities 1-2; Languages; Music 37-38; Philos-
ophy 1, 2

Group III.—Six semester credits from Economics;
Government; History

JUNIOR YEAR		
P. E. 5, 6, (<i>women</i>)	1	1
O. T. 1, 2, <i>Crafts</i>	2	3
O. T. (10), <i>Lettering and Printing</i>	2	
O. T. 42, <i>Theory of Occupational Therapy</i>		2
Psych. 37, <i>Developmental Psychology</i>	3	
Psych. 54, <i>Psychopathology</i>		3
Zool. 19, <i>Kinesiology</i>	3	
Zool. 64, <i>Neurology</i>		4
O. T. (49), <i>Clinical Subjects</i>		2
Electives		
	16	16

COLLEGE OF LIBERAL ARTS

SENIOR YEAR

O. T. (6), <i>Weaving</i>	3	
O. T. (5), <i>Jewelry and Metalwork</i>	3	
O. T. 7-8, <i>Elementary Processes in Wood and Plastics</i>	2	2
O. T. 15-16, <i>Ceramics and Modeling</i>	2	2
O. T. (44), 46, <i>Theory of Occupational Therapy</i>	2	3
O. T. (50), <i>Clinical Subjects</i>	2	
Elective		
	16	16

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 84.

UNIVERSITY OF NEW HAMPSHIRE

PRE-MEDICAL CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95. (Include Chemistry 3, 4.)		
Math. 7-8, <i>Fundamental Mathematics</i>	3	3
	16	16
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
P. E. 3, 4, (<i>women</i>)	1	1
Biol. 1-2, <i>Man and the Living World</i>	3	3
Chem. (21), <i>Semimicro Qualitative Analysis</i>		4
*Language (French or German)	3	3
Phys. 1-2, <i>Introductory Physics</i>	4	4
‡Social Science	3	or 3
†Elective		
	16	16
JUNIOR YEAR		
P. E. 5, 6, (<i>women</i>)	1	1
Chem. 51-52, <i>Organic Chemistry</i>	5	5
*Language	3	3
‡Social Science	3	3
Zool. 7-8, <i>General Zoology and Comparative Anatomy</i>	5	5
†Elective		
	16	16
SENIOR YEAR		
§Humanities Group	3	3
‡Social Science	3	or 3
†Elective		
	16	16

* Either French or German. If the student passes an entrance reading test in either French or German, one year of the same language will fulfill the language requirement. To fulfill the requirement the student must complete either French 2; 3-4; or 5-6; German 3-4; or 5-6.

† No more than 24 semester hours of Biology (including Botany, Bacteriology, Entomology, and Zoology), Chemistry and Physics in addition to the required courses may be taken as elective.

‡ The student must complete 12 semester hours selected from courses in the following departments: Economics, Government, History (other than History 1, 2), Psychology, Sociology. Courses from at least three of the five departments must be presented.

§ The student must complete 6 semester hours from the following courses: Humanities 1-2; Music 37-38; Arts 31, 32; Philosophy; English 13, 14, 15, 16, (or English courses numbered 52-100).

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 85.

COLLEGE OF LIBERAL ARTS

SECRETARIAL CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95.		
Electives	16	16
SOPHOMORE YEAR		
P. E. 3, 4, (<i>women</i>)	1	1
B. A. 24, <i>Introduction to Business</i>		3
Econ. 3, <i>Economic and Commercial Development of U. S.</i>	3	
Secl. 1-2, <i>Shorthand</i>	3	3
Secl. 7-8, <i>Typewriting</i>	2	2
Secl. 23-24, <i>Business Writing</i>	3	3
*Electives	16	16
JUNIOR YEAR		
P. E. 5, 6, (<i>women</i>)	1	1
B. A. 1-2, <i>Elementary Accounting</i>	3	3
Elective from Group I	3	3
†Secl. 3-4, <i>Advanced Shorthand</i>	3	3
†Secl. 9-10, <i>Advanced Typewriting</i>	2	2
Electives	16	16

Group I.—A year's work (two sequential semesters)
from Arts 31, 32; English 13, 14; or 15, 16;
Humanities 1-2; Languages; Music 37-38; Phi-
losophy 1, 2

* Students preparing to teach secretarial subjects must elect in addition a sufficient number of courses in Education to meet state requirements. See page (?) for a description of the Commercial Teacher Preparation program as an option in the Secretarial curriculum.

† A grade of C or better in Secl. 8 will be required of students electing Secl. 9-10; and a grade of C or better in Secl. 2 will be required of students electing Secl. 3-4.

UNIVERSITY OF NEW HAMPSHIRE

SENIOR YEAR

B. A. 21-22, <i>Commercial Law</i>	3	3
Secl. 11, <i>Filing</i>	2	
Secl. (13), <i>Office Machines</i>		2
Secl. 17-18, <i>Office Procedure and Practice</i>	3	3
Elective from Group III	3	3
Electives		
	16	16

Group III.—Six semester credits from Government;
History; Psychology; Sociology

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 86.

COLLEGE OF LIBERAL ARTS

SOCIAL SERVICE CURRICULUM

FRESHMAN YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95. (Include Biology 1-2; or 3.)		
Soc. 1, <i>Introductory Sociology</i>	3	
Electives		
	16	16

SOPHOMORE YEAR

R.O.T.C.	1½	1½
P. E. 3, 4, (<i>women</i>)	1	1
Bact. 5, <i>Public Health and Sanitation</i>	3	
Psych. 1, <i>General Psychology</i>	3	
Psych. (47), <i>Mental Hygiene</i>		3
Soc. 27, <i>The Family</i>	3	
Soc. 44, <i>Social Psychology</i>		3
Electives from Group I	3	3
Electives		
	16	16

Group I.—A year's work (two sequential semesters)
from Arts 31, 32; English 13, 14; or 15, 16;
Humanities 1-2; Languages; Music 37-38; Phi-
losophy 1, 2

JUNIOR YEAR

P. E. 5, 6, (<i>women</i>)	1	1
Soc. 71, <i>Criminology</i>	3	
Soc. 73, 74, <i>Introduction to Social Welfare</i>	3	3
Elective from Group III	3	3
Electives		
	16	16

Group III.—Six semester credits from Economics;
Government; History

SENIOR YEAR

Psych. 54, <i>Psychopathology</i>		3
Soc. 75, 76, <i>Methods of Social Research</i>	3	3
Soc. 97, <i>Social Welfare Field Experience</i>	6	
One course must be elected from: Bot. 6, or 42; Psych. 78; Ent. 2; Zool. 7, 17, 36, or 61	3, 4, 5 or 3	
Electives		
	16	16

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 87.

UNIVERSITY OF NEW HAMPSHIRE

ART EDUCATION CURRICULUM

FRESHMAN YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95.		
Arts 23, <i>Basic Design</i>	2	
Arts 24, <i>Drawing and Design</i>		2
Electives		
	16	16

SOPHOMORE YEAR

R.O.T.C.	1½	1½
P. E. 3, 4, (<i>women</i>)	1	1
Arts 15, 16, <i>Ceramics</i>	2	2
Arts 25, 26, <i>Advanced Drawing and Painting</i>	3	3
Educ. 41, <i>Educational Psychology</i>	3	
Elective from Group I	3	3
Elective from Group III	3	3
Elective		
	16	16

Group I.—A year's work (two sequential semesters)
from English 13, 14; or 15, 16; Humanities 1-2;
Languages; Music 37-38; Philosophy 1, 2

Group III.—Six semester credits from Economics;
Government; History; Psychology; Sociology

JUNIOR YEAR

P. E. 5, 6, (<i>women</i>)	1	1
Arts 3, <i>Crafts</i>	2	
Arts 27, <i>Graphic Arts</i>	3	
Arts 28, <i>Advertising Design</i>	} or }	
Arts 38, <i>Illustration</i>		2
Arts 31, 32, <i>Introduction to The Arts</i>	3	3
Sp. (37), <i>Stagecraft</i>		3
Educ. 57, <i>Principles of Learning</i>	3	
Educ. 58, <i>Principles of Teaching</i>		3
H. Ec. 31, <i>Interior Design</i>	3	
Elective		
	18	16

COLLEGE OF LIBERAL ARTS

SENIOR YEAR

Arts 29, <i>Advanced Painting and Composition</i>	3	
Art-Ed. 91, <i>Problems of Teaching Art in Elementary Schools</i>	3	
Art-Ed. (92), <i>Problems of Teaching Art in Secondary Schools</i>	3	
Ed. 59, <i>Principles of Education</i>	3	
Ed.-Art 94, <i>Supervised Teaching</i>		14
H. Ec. 65, <i>History of Costume</i>	3	
Elective		
	16	14

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 89.

UNIVERSITY OF NEW HAMPSHIRE

MUSIC EDUCATION CURRICULUM

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95.		
*Applied Music	2	2
†Mus. 9-10, <i>Sightsinging, Ear Training, Dictation I</i> ..	0	0
‡Recitals		
Electives		
	15	15

SOPHOMORE YEAR		
R.O.T.C.	1½	1½
P. E. 3, 4, (women)	1	1
*Applied Music	2	2
Educ. 41, <i>Educational Psychology</i>		3
§Mus. 11-12, <i>Harmony I</i>	2	2
Mus. 13-14, <i>Sightsinging, Ear Training, Dictation II</i> ..	1	1
||Mus. 37-38, <i>Introduction to Music Literature</i>	3	3
Mus. 41-42, <i>Principles of Conducting</i>	1	1
Music Organizations	½	½
Electives from Group III	3	3
Elective	3	
‡Recitals		
	17	17

Group III.—Six semester credits from Economics;
Government; History; Psychology; Sociology

JUNIOR YEAR		
P. E. 5, 6, (women)	1	1
*Applied Music	3	3
Educ. 57, <i>Principles of Learning</i>	3	
Educ. 58, <i>Principles of Teaching</i>		3
¶Language (French, German, or Italian)	3	3
Mu.-Ed. 90, <i>Problems in the Teaching of Elementary School Music</i>		3
Mu.-Ed. 97, <i>Techniques and Methods in Brass and Percussion Instruments</i>	2	
Mus. 15-16, <i>Harmony II</i>	2	2
Mus. 97-98, <i>Orchestration and Chorestration</i>	2	2
Music Organization	½	½
‡Recitals		
	17½	17½

* For explanation of footnotes, see next page.

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SENIOR YEAR	First Semester Credits	Second Semester Credits
*Applied Music	2	
Ed. 59, <i>Principles of Education</i>	3	
Mu.-Ed. 93, <i>Problems in the Teaching of Secondary School Music</i>	3	
Mu.-Ed. 95, <i>Techniques and Methods in String In- struments</i>	2	
Mu.-Ed. (96), <i>Techniques and Methods in Woodwind Instruments</i>	2	
Music Organizations	1	
Ed.-Mu. (93), <i>Supervised Teaching of Elementary School Music</i>		7
Ed.-Mu. 94, <i>Supervised Teaching of Secondary School Music</i>		7
Electives	4	
‡Recitals		
	17	14

* A minimum of 16 semester credits in Applied Music must be offered by students in this curriculum.

† Qualified students are exempted from this requirement upon proper notification to the College Dean's office and the University Registrar.

‡ Recitals — Students enrolled in this curriculum must accumulate a minimum of 24 points in the sophomore, junior, and senior years. Attendance at each concert or recital constitutes one point.

§ Although Mus. 9-10 is normally a prerequisite to 11-12, the latter may be taken in the freshman year concurrently with Music 9-10, provided that the student is familiar with the keyboard and can read simple pianoforte music.

|| This course may be taken during the freshman year.

¶ Students must complete a year course in Language; passing the reading examination does not fulfill this requirement.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 90.

UNIVERSITY OF NEW HAMPSHIRE

PHYSICAL EDUCATION TEACHER PREPARATION CURRICULUM FOR MEN

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95. (Include Biology 1-2; or 3.)		
Basic course in second teaching major	3	3
	16	16
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
Educ. 41, <i>Educational Psychology</i>	3	
P. E. (23), <i>Principles of Physical Education</i>		3
Second teaching major; Second year	3	3
Zool. 17, <i>Human Anatomy</i>	4	
Zool. 18, <i>Human Physiology</i>		3
Group III	3	3
Group I	3	3
	17½	16½

Group III.—Six semester credits from Economics; Government; Psychology; Sociology

JUNIOR YEAR

Educ. 57, <i>Principles of Learning</i>	3	
Educ. 58, <i>Principles of Teaching</i>		3
P. E. (61), <i>Problems of Teaching in Physical Education</i>		3
*Problems of coaching, <i>P. E. 47, (48)</i>	4	
*Problems of coaching, <i>P. E. (45), 46</i>		4
Second teaching major	3	3
Ed. 59, <i>Principles of Education</i>		3
Elective, <i>first teaching minor</i>		
	10	16

Group I.—A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

* For explanation of footnotes, see next page.

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SENIOR YEAR	First	Second
	Semester	Semester
	Credits	Credits
Ed.-P. E. 93, <i>Directed Teaching in Physical Education</i>	3	
P. E. 65, <i>Administration of Physical Education in Secondary Schools</i>	3	
*Problems of coaching, P. E. 47, (48)	4	
Problems of teaching, <i>Second teaching major, i.e., Engl.-Ed. 91, etc.</i>	3	
†Second teaching major	3	
Supervised teaching in major or majors, <i>i.e., Ed.-Engl. 94, etc.</i>		14
Electives		
	16	14

* Four problems of coaching courses are required.

† Students must select for a second teaching major one of the subjects for which Educ. 91 courses are offered. It is important that students acquaint themselves with the prerequisites of the Educ. 91 course in the subject matter of their second teaching major.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 91.

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PHYSICAL EDUCATION TEACHER PREPARATION CURRICULUM FOR WOMEN

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
See freshman requirements, page 95. (Include Biology 1, 2; or 3; see required activities for Physical Education 1, 2 on page 92.)		
Electives	16	16
 SOPHOMORE YEAR		
P. E. 3, 4, <i>Physical Education</i>	1	1
P. E. 13, 14, <i>Physical Education</i>	1	1
P. E. 23, <i>Principles of Physical Education</i>	3	
P. E. (36), <i>Recreation Leadership</i>	3	
Educ. (41), <i>Educational Psychology</i>		3
Zool. 17, <i>Human Anatomy</i>	4	
Zool. 18, <i>Human Physiology</i>		3
Elective from Group I	3	3
Elective		
	18	16

Group I.—A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

JUNIOR YEAR

Physical Education Option†

P. E. 5, 6, <i>Physical Education</i>	1	1
Educ. 57, <i>Principles of Learning</i>	3	
Educ. 59, <i>Principles of Education</i>		3
P. E. 53, 54, <i>The Theory of Teaching Dance</i>	2	2
P. E. 56, <i>Health Education</i>		3
P. E. 63, 64, <i>The Theory of Teaching Team Sports</i>	2	2
Zool. 19, <i>Kinesiology</i>	3	
Elective from Group III	3	3
Electives		
	16	16

Group III.—Six semester credits from Economics; Government; History; Psychology; Sociology

† Students desiring to teach in areas in addition to Physical Education should plan to take Educ. 58. They should also elect 18 semester hours in a second teaching field.

COLLEGE OF LIBERAL ARTS

JUNIOR YEAR

	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
Recreation Education Option*		
P. E. 5, 6, ...	1	1
Sp. 37, <i>Stagecraft</i>	3	
Arts 4, <i>Crafts</i>		2
Educ. 57, <i>Principles of Learning</i>	3	
For. 38, <i>Nature Education</i>		3
P. E. 24, <i>Organized Camping</i>		3
P. E. 53, 54, <i>The Theory of Teaching Dance</i>	2	2
P. E. 73, 74, <i>The Theory of Teaching Individual Sports for Women</i>	2	2
Soc. 1-2, <i>Introductory Sociology: Social Problems</i> ..	3	3
Electives		
	16	16

SENIOR YEAR

Physical Education Option

Ed.-P. E. 92, <i>Directed Teaching of Physical Education for Women</i>		6
P. E. 55, <i>Remedial Gymnastics</i>	3	
P. E. (66), <i>Administration of Physical Education</i> ...	3	
P. E. 73, 74, <i>The Theory of Teaching Individual Sports for Women</i>	2	2
P. E.-Ed. 91, <i>Problems in the Teaching of Physical Education for Women</i>	3	
Electives other than Physical Education	3	3
Electives		
	16	16

Recreation Education Option*

Sp. 62, <i>Directing</i>		3
†Music 37, <i>Introduction to Music Literature</i>	3	
P. E. (66), <i>Administration of Physical Education</i> ...	3	
P. E. 96, <i>Recreation Field Work</i>		6
P. E.-Ed. 91, <i>Problems in the Teaching of Physical Education for Women</i>	3	
Soc. 44, <i>Social Psychology</i>		3
‡Elective from Group I	3	3
Elective from Group III	3	3
Elective		
	16	16

* In addition to the requirements listed above, each student is required to secure before graduation a minimum of 8 points of community recreation or camping credits. (See page 92.)

† If Music has already been taken in the sophomore year, 3 additional hours in Group I must be taken in the senior year.

‡ This senior requirement may be fulfilled by any two semester courses from the sophomore Group I listing; they need not be sequential.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 91.

The College of Technology

ROBERT N. FAIMAN, *Dean*

JOHN B. HRABA, *Associate Dean*

CHEMICAL ENGINEERING

ELECTRICAL ENGINEERING

CIVIL ENGINEERING

MECHANICAL ENGINEERING

CHEMISTRY

MATHEMATICS

PHYSICS

GENERAL INFORMATION

The College of Technology is organized to offer its students a vigorous professional education in engineering, the physical sciences, or mathematics. All programs require a basic core of studies in the humanistic-social and life science areas, in addition to a thorough grounding in the basic aspects of mathematics and the physical sciences and the specialized studies of the chosen professional area. This pattern of undergraduate work is designed to provide a base either for a successful career in industry or for advanced study at the graduate level. Since modern technology is drawing engineering applications and their scientific bases more closely together, the engineering curricula are oriented to emphasize the theoretical-scientific aspects of engineering with a corollary deemphasis of its more applied phases. The importance of the role and responsibility of the engineer or scientist in modern society is emphasized through study in the humanistic-social areas.

REQUIREMENTS FOR DEGREES

The College of Technology offers the following baccalaureate degrees: Bachelor of Science in Chemical Engineering, Bachelor of Science in Chemistry, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Mathematics, Bachelor of Science in Mechanical Engineering, and Bachelor of Science in Physics. Each candidate for a degree must satisfy all general University requirements for graduation, complete at least 144 semester credits, including the courses required in one of the four-year curricula described below, and achieve a minimum grade-point average of 1.8. Each candidate must include in his course of study 24 or more credits in social-humanistic or non-technical courses. Such courses must have the approval of the department in which the candidate is majoring. For information concerning advanced degrees, see the Graduate School catalogue.

CURRICULA

Curricula of the various departments in the College of Technology are revised and modified as required to reflect the patterns of their professional areas and to provide an effective base for the future professional growth of their graduates. Entering students may anticipate that a curricular program as presented, or as subsequently modified, will permit their graduation in four years, assuming normal loads and progress. If a break in attendance occurs, or other than normal progress is made, the curricular requirements and objectives which must ordinarily be satisfied will be those which are in effect at the time of graduation. Specific programs accomplishing this

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will be prepared by the student and his adviser for approval by the Executive Committee of the College.

The following four-year curricula are offered:

Chemical Engineering

Chemical Engineering is that branch of engineering which involves the application of chemistry, physics, mathematics, and fundamental engineering principles to the design, construction, and operation of equipment for carrying out chemical processes on an industrial scale at the lowest possible cost. The Chemical Engineering curriculum, therefore, provides the student basic training in the physical sciences, engineering principles, and economics. Although chemical engineering is a distinct profession, chemical engineers are also considered to be members of the chemical profession and a considerable portion of the Chemical Engineering curriculum is devoted to the science of chemistry. However, emphasis is placed upon the large-scale manufacture of chemical products instead of the laboratory phases of chemistry.

Chemistry

This curriculum is intended to prepare the student for the career of a professional chemist in industry and to give a good foundation for graduate study leading to original and independent research.

Instruction is given by lectures, recitations, and carefully supervised laboratory work. The laboratory study is largely individual and the course work of each student is planned to furnish a broad knowledge of chemical science. The student may elect either German or French to enable him to read with ease the chemical literature, and he receives a grounding in mathematics and physics necessary for the later courses in chemistry. In the senior year, an independent research project is undertaken, permitting the student to use the reference library and chemical periodicals throughout the course of a laboratory investigation.

Civil Engineering

The profession of Civil Engineering, the oldest of the major branches of engineering practice, embraces the functions of planning, design, and construction of buildings, bridges, dams, transportation projects, and public works in general.

The curriculum includes a study of those basic sciences which are essential to the practice of Civil Engineering, and the application of those principles in the classroom, design room, and laboratory. Additional work is provided in the social-humanistic fields to produce a graduate who is technically competent and well adjusted to his social environment.

Electrical Engineering

This curriculum provides instruction intended to prepare the student for graduate study or to begin his career in professional electrical engineering. In the first two years the student concentrates on mathematics and basic sciences which provide essential preparation for the engineering science, analysis, and design courses of the last two years. Since the emphasis is on fundamentals, the curriculum does not provide for extensive specialized

UNIVERSITY OF NEW HAMPSHIRE

training in any particular sub-branch of electrical engineering. In the junior and senior years, however, the student is provided an opportunity to elect courses in particular areas of interest.

Mathematics

The Technology curriculum in Mathematics consists of a thorough grounding in calculus, followed by advanced work in algebra, analysis, applied mathematics, and geometry. Such a program meets the requirements currently set by graduate schools for admission to graduate study in mathematics. It also furnishes the basic mathematical training required of mathematicians in industry and government. Modern science continues to increase its demands on the undergraduate mathematics program and the Technology Mathematics curriculum is subject to continual scrutiny and revision in an effort to keep up with these demands. Every effort is made to give the student of mathematics the most up-to-date possible presentation of the basic subject matter in this field.

Mechanical Engineering

The Mechanical Engineering curriculum is intended to prepare young men and women either for graduate study or to enter the field of professional mechanical engineering. The curriculum provides a firm foundation in the basic physical sciences and the engineering sciences, augmented by a coordinated sequence of social-humanistic courses. Training is provided in the organization and utilization of principles, personnel, and physical resources for the solution of mechanical engineering problems.

Physics

The Technology curriculum in Physics is intended to offer basic training in fundamentals, supplemented by laboratory work, in the various branches of physics. Opportunity is given in the senior year for experimental investigation in some of the fields of physics under guidance of staff members. Such a curriculum prepares its graduates for basic research in industry, the various government research organizations, or for continued academic study toward advanced degrees.

Agricultural Engineering

Agricultural Engineering is offered in the College of Agriculture (see page 50). Basic science and some engineering courses in the curriculum of Agricultural Engineering are given by the College of Technology.

HONORS PROGRAM

The College of Technology, through its various departments, offers the superior student the opportunity to participate in an Honors Program which is individually designed to provide added intellectual incentives and opportunities beyond those offered in the regular curricula. Admission to Honors status is by invitation of the department concerned and with the approval of the Dean of the College. It is limited to those students entering the junior year with at least a 3.0 average.

The program permits the student, with approval of his departmental adviser and the Dean, to develop an individualized plan of study which,

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within the framework of his chosen professional area, may include appropriate courses from any of the Colleges in the University in lieu of, and/or in addition to, those courses normally prescribed.

JOINT DEGREE PROGRAM IN LIBERAL ARTS AND TECHNOLOGY

Students interested in combining a professional curriculum in engineering or the physical sciences as offered in the College of Technology with the liberal educational opportunities available in the College of Liberal Arts may elect a five-year joint program of study. Students interested should confer as early as possible in their academic careers with the Deans of both Colleges. If a student is approved for the dual program, advisers from both Colleges will assist in the preparation of an integrated plan of study which will provide for the satisfaction of the requirements of both Colleges. Normally, two degrees, Bachelor of Arts and Bachelor of Science, will be awarded upon completion.

UNIVERSITY OF NEW HAMPSHIRE

CHEMICAL ENGINEERING

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 31, 32	1½	1½
R.O.T.C.	1½	1½
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
*Math. 21-22, <i>Calculus IB and IIB, or</i> Math. 25-26, <i>Calculus IA and IIA</i>	5	5
M. E. 13-14, <i>Engineering Drawing</i>	1	1
Phys. 18, <i>General Physics I</i>		4
Approved Social-Humanistic Elective	3	
	18	19
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
Chem. 21, <i>Semimicro Qualitative Analysis</i>	4	
Chem. 22, <i>Quantitative Analysis</i>		5
†Math 23-24, <i>Calculus IIIB and Differential Equations</i> or Math. 27-24, <i>Multi-dimensional Calculus and</i> <i>Differential Equations</i>	5	3
Phys. 23-24, <i>General Physics II and III</i>	4	4
M. E. 25, <i>Statics</i>	2	
M. E. 26, <i>Dynamics</i>		3
Approved Social-Humanistic Elective	3	3
	19½	19½
JUNIOR YEAR		
Chem. 47-48, <i>Organic Chemistry</i>	5	5
Chem. 83-84, <i>Physical Chemistry</i>	5	5
Ch. E. 51-52, <i>Chemical Engineering Principles I and II</i>	4	4
Ch. E. 54, <i>Chemical Engineering Principles III</i>		3
Approved Social-Humanistic Elective	3	
	17	17

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 21-22-23 sequence will normally enroll in Math. 27 in lieu of a technical elective during the junior year.

‡ Technical electives must be approved by the Department Chairman.

COLLEGE OF TECHNOLOGY

SENIOR YEAR

Ch. E. 63, <i>Chemical Engineering Principles IV</i>	3	
Ch. E. 65, <i>Chemical Engineering Laboratory</i>	2	
Ch. E. 66, <i>Chemical Engineering Economics and Plant Design</i>		4
Ch. E. 67, <i>Chemical Engineering Thermodynamics</i> ..	3	
Ch. E. 68, <i>Metallography</i>		3
Ch. E. 69, <i>Chemical Engineering Project</i>		3
E. E. 39, <i>Fundamentals of Electrical Engineering</i>	4	
Approved Social-Humanistic Elective	6	3
‡Technical Elective		4
	18	17

UNIVERSITY OF NEW HAMPSHIRE

TECHNOLOGY CURRICULUM IN CHEMISTRY

FRESHMAN YEAR	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
P. E. 31, 32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Chem. 5-6, <i>General Chemistry and Qualitative Analysis</i>	6	6
Engl. 1-2, <i>Freshman English</i>	3	3
M. E. 13, <i>Engineering Drawing</i> , or Elective	1	
*Math. 21-22, <i>Calculus IB and IIB</i> , or		
Math. 25-26, <i>Calculus IA and IIA</i>	5	5
Phys. 18, <i>General Physics I</i>		4
	17	20

SOPHOMORE YEAR

R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Chem. 47-48, <i>Organic Chemistry</i>	5	5
†Math. 23, <i>Calculus IIIB</i>	5	
Math. 24, <i>Differential Equations</i> , or Elective		3
Phys. 23-24, <i>General Physics II and III</i>	4	4
Electives	3	3
	$18\frac{1}{2}$	$16\frac{1}{2}$

JUNIOR YEAR

Chem. 61-62, <i>Analytical Chemistry</i>	5	5
Chem. 83-84, <i>Physical Chemistry</i>	5	5
Chem. (55), <i>Organic Chemistry</i>		3
Ger. 1-2, <i>Elementary German</i>	3	3
Elective	6	3
	19	19

SENIOR YEAR

Chem. (56), <i>Organic Chemistry</i>	3	
Chem. 85, <i>Inorganic Chemistry</i>	3	
Chem. 86, <i>Physical Chemistry</i>		3
Chem. 87-88, <i>Chemical Literature and Seminar</i>	1	1
Chem. 89-90, <i>Thesis</i>	6	6
Elective	5	6
	18	16

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 25-26 sequence will substitute a technical elective here.

COLLEGE OF TECHNOLOGY

CIVIL ENGINEERING

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
P. E. 31, 32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
*Math. 21-22, <i>Calculus IB and IIB</i> , or Math. 25-26, <i>Calculus IA and IIA</i>	5	5
M. E. 13-14, <i>Engineering Drawing</i>	1	1
Phys. 18, <i>General Physics I</i>		4
Approved Social-Humanistic Elective	3	
	18	19
SOPHOMORE YEAR		
R.O.T.C.	1 $\frac{1}{2}$	1 $\frac{1}{2}$
C. E. 1, <i>Surveying</i>	3	
C. E. 2, <i>Advanced Surveying</i>		3
†Math. 23-24, <i>Calculus IIIB and Differential Equations</i> or Math. 27-24, <i>Multi-dimensional Calculus and</i> <i>Differential Equations</i>	5	3
Phys. 23-24, <i>General Physics II and III</i>	4	4
M. E. 25, <i>Mechanics, Statics</i>	2	
M. E. (35), <i>Strength of Materials</i>		3
Approved Social-Humanistic Elective	3	3
	18 $\frac{1}{2}$	17 $\frac{1}{2}$
JUNIOR YEAR		
C. E. 17, <i>Engineering Materials</i>	3	
C. E. 25, <i>Theory of Determinate Structures</i>	4	
C. E. 50, <i>Transportation Engineering</i>		3
C. E. 52, <i>Fluid Mechanics</i>		3
C. E. (53), <i>Fluid Mechanics Laboratory</i>		1
C. E. 56, <i>Steel Design</i>		3
E. 39, <i>Electrical Engineering Fundamentals</i>	4	
Geol. 7, <i>General Geology</i> (or Geol. 1)	2	
M. E. (26), <i>Mechanics, Dynamics</i>	3	
M. E. (33), <i>Thermodynamics</i>		3
Engl. (23), <i>Writing of Technical Reports</i>		2
Approved Social-Humanistic Elective	3	3
	19	18

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 21-22-23 sequence will normally enroll in Math. 27 in lieu of a technical elective during the junior year.

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SENIOR YEAR

Approved C. E. Elective	3	3
C. E. (54), <i>Soil Mechanics and Foundations</i>	4	
C. E. 57, <i>Theory of Indeterminate Structures</i>	4	
C. E. 59, <i>Reinforced Concrete Design</i>	3	
C. E. 63-64, <i>Hydraulic and Sanitary Engineering</i>	3	4
Approved Social-Humanistic Elective		3
Approved Technical Electives		8
	17	18

COLLEGE OF TECHNOLOGY

ELECTRICAL ENGINEERING

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
P. E. 31, 32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
*Math. 21-22, <i>Calculus IB and IIB, or</i> Math. 25-26, <i>Calculus IA and IIA</i>	5	5
M. E. 13-14, <i>Engineering Drawing</i>	1	1
Phys. 18, <i>General Physics I</i>		4
Approved Social-Humanistic Elective	3	
	18	19

SOPHOMORE YEAR		
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
E. E. 1-2, <i>Electrical Engineering</i>	3	4
†Math. 23-24, <i>Calculus IIIB and Differential Equations</i> or Math. 27-24, <i>Multi-dimensional Calculus and</i> <i>Differential Equations</i>	5	3
M. E. 25-26, <i>Statics, Dynamics</i>	2	3
Physics 23-24, <i>General Physics II and III</i>	4	4
Approved Social-Humanistic Elective	3	3
	18½	18½

JUNIOR YEAR		
E. E. 3-4, <i>Applied Electromagnetics</i>	3	3
E. E. 5, <i>Electric Circuits</i>	3	
E. E. 9-10, <i>Electronics</i>	3	4
E. E. 15-16, <i>Student Branch A.I.E.E.-I.R.E.</i>	0	0
E. E. 23, 24, <i>Electrical Laboratory</i>	2	2
M. E. (35), <i>Strength of Materials</i>		3
M. E. 33, 36, <i>Thermodynamics, Fluid Mechanics</i>	3	3
M. E. 37, <i>Mechanical Laboratory</i>	1	
Approved Social-Humanistic Elective		3
‡Approved Elective	3	
	18	18

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 21-22-23 sequence will normally enroll in Math. 27 in lieu of a technical elective during the junior year.

‡ Electives are selected with the advice and consent of the adviser.

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SENIOR YEAR

English (23), <i>Writing of Technical Reports</i>		2
E. E. 17, 18, <i>Student Branch A.I.E.E.-I.R.E.</i>	0	0
E. E. 25, 26, <i>Electrical Laboratory</i>	2	2
E. E. 45, 46, <i>Electrical Networks, Fields</i>	3	3
M. E. (34), <i>Thermodynamics</i>	3	
M. E. 65, <i>Engineering Economy</i>	3	
Approved Social-Humanistic Elective	3	3
‡Approved Elective	4	7
	18	17

COLLEGE OF TECHNOLOGY

TECHNOLOGY CURRICULUM IN MATHEMATICS

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
P. E. 31, 32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Engl. 1-2, <i>Freshman English</i>	3	3
Chem. 3-4, <i>General Chemistry</i>	4	4
*Math. 21-22, <i>Calculus IB and IIB, or</i> Math. 25-26, <i>Calculus IA and IIA</i>	5	5
Phys. 18, <i>General Physics I</i>	4	4
Non-Technical Elective	3	
	17	18
SOPHOMORE YEAR		
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
†Math. 23-24, <i>Calculus IIIB and Differential Equations</i> or Math. 27-24, <i>Multi-dimensional Calculus and</i> <i>Differential Equations</i>	5	3
Math. 41, <i>Probability</i>	3	
Math. 42, <i>Statistics</i>		3
Phys. 23-24, <i>General Physics II and III</i>	4	4
Ger. 1-2, <i>Elementary German</i>	3	3
Non-Technical Elective	3	3
	$19\frac{1}{2}$	$17\frac{1}{2}$
JUNIOR YEAR		
Math. 61-62, <i>Higher Algebra I and II</i>	4	4
Math. 67-68, <i>Real Analysis I and II</i>	4	4
Math. 55, <i>Fundamental Concepts of Geometry</i>	4	
Math. 58, <i>Fourier Series and Boundary Value Problems</i> Ger. 3-4, <i>Intermediate German</i>	3	4
Non-Technical Elective	3	3
	18	18

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 21-22-23 sequence will normally enroll in Math. 27 in lieu of a technical elective during the junior year.

‡ To be chosen from Math. 54, 56, 81, 82, 83, and 96.

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SENIOR YEAR

Math. (84), <i>Topology</i>	4	
Math. 88, <i>Complex Analysis</i>		4
‡Math. Elective	4	4
French 1-2, <i>Elementary French</i>	3	3
Non-Technical Elective	6	3
Elective		3
Senior Seminar	1	1
	18	18

COLLEGE OF TECHNOLOGY

MECHANICAL ENGINEERING

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
P. E. 31, 32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Chem. 3-4, <i>General Chemistry</i>	4	4
Engl. 1-2, <i>Freshman English</i>	3	3
*Math. 21-22, <i>Calculus IB and IIB</i> , or Math. 25-26, <i>Calculus IA and IIA</i>	5	5
M. E. 13-14, <i>Engineering Drawing</i>	1	1
Phys. 18, <i>General Physics I</i>		4
Approved Social-Humanistic Elective	3	
	18	19

SOPHOMORE YEAR		
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
†Math. 23-24, <i>Calculus IIIB and Differential Equations</i> , or Math. 27-24, <i>Multi-dimensional Calculus and Differential Equations</i>	5	3
M. E. 17-18, <i>Manufacturing Processes and Design</i>	3	3
M. E. 25, <i>Statics</i>	2	
M. E. 26, <i>Dynamics</i>		3
Phys. 23-24, <i>General Physics II and III</i>	4	4
Approved Social-Humanistic Elective	3	3
	$18\frac{1}{2}$	$17\frac{1}{2}$

JUNIOR YEAR		
E. E. 39-40, <i>Electrical Engineering</i>	4	4
M. E. 33, 34, <i>Thermodynamics</i>	4	4
M. E. 35, <i>Strength of Materials</i>	3	
M. E. 36, <i>Fluid Mechanics</i>		3
M. E. 37, 38, <i>Mechanical Laboratory</i>	1	2
Approved Social-Humanistic Elective	3	3
‡Technical Elective	3	3
	17	18

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 21-22-23 sequence will normally enroll in Math. 27 in lieu of a technical elective during the junior year.

‡ Technical Elective courses must be approved by the Department.

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SENIOR YEAR

E. E. 41, <i>Electrical Engineering</i>	3	
M. E. 39, <i>Engineering Materials</i>	3	
M. E. 41-42, <i>Mechanical Engineering Seminar</i>	1	1
M. E. 43-44, <i>Machine Design and Analysis</i>	3	3
M. E. 57-58, <i>Heat and Power Systems</i>	4	4
M. E. (65), <i>Engineering Economy</i>		3
Approved Social-Humanistic Elective	3	3
‡Technical Elective	3	3
	20	17

COLLEGE OF TECHNOLOGY

TECHNOLOGY CURRICULUM IN PHYSICS

FRESHMAN YEAR	First Semester Credits	Second Semester Credits
P. E. 31, 32	$\frac{1}{2}$	$\frac{1}{2}$
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
Engl. 1-2, <i>Freshman English</i>	3	3
Chem. 3-4, <i>General Chemistry</i>	4	4
*Math. 21-22, <i>Calculus IB and IIB</i> , or Math. 25-26, <i>Calculus IA and IIA</i>	5	5
Phys. 18, <i>General Physics I</i>		4
Non-Technical Elective	3	
	17	18

SOPHOMORE YEAR		
R.O.T.C.	$1\frac{1}{2}$	$1\frac{1}{2}$
†Math. 23, <i>Calculus IIIB</i>	5	
†Math. 24, <i>Differential Equations</i>		3
Phys. 23-24, <i>General Physics II and III</i>	4	4
Ger. 1-2, <i>German</i>	3	3
Non-Technical Elective	3	6
	16½	17½

JUNIOR YEAR		
Math. 51-52, <i>Advanced Calculus</i>	3	3
Phys. 31-32, <i>Physical Mechanics</i>	4	4
Phys. 34, <i>Electricity and Magnetism</i>		4
Phys. 35-36, <i>Experimental Physics I and II</i>	3	2
Phys. 37, <i>Modern Physics</i>	3	
Non-Technical Elective	3	3
‡Technical Elective	3	3
	19	19

SENIOR YEAR		
Phys. 91, 92, <i>Atomic Physics, Nuclear Physics</i>	4	4
Phys. 93, 94, <i>Theoretical Physics I and II</i>	5	5
Phys. 95-96, <i>Experimental Physics III and IV</i>	3	3
Non-Technical Elective	3	3
‡Technical Elective	3	3
Phys. 97, 98, <i>Colloquium</i>	1	1
	19	19

* Sequence will be assigned on the basis of mathematics entrance examination.

† Students in the Math. 25-26 sequence may enroll in Math. 24 in either semester and will substitute a technical elective for Math. 23.

‡ Phys. 81, Physical Optics, Phys. 82, Thermodynamics, or other approved elective. Those interested in experimental physics are advised to elect a sequence of electronic courses in Electrical Engineering.

The Graduate School

The Graduate School, which has offered instruction since 1903, has for its objective the bringing together of faculty and qualified students in a spirit of scholarship and research. The graduate student is given opportunity to specialize in some field of knowledge, and to develop a maturity of thought and attitude toward his professional field, so that both his professional and his cultural life are enhanced. The work of the Graduate School is under the general direction of the Graduate Faculty. The Dean of the Graduate School is responsible for the administration of the regulations and requirements pertaining to admission, conduct of work, the granting of advanced degrees, and other pertinent matters.

Degrees

Graduate programs are offered in the following disciplines: Agricultural Economics, Agricultural Education, Agronomy, Animal Science, Bacteriology, Biochemistry, Botany, Chemical Engineering, Chemistry, Civil Engineering, Dairy Science, Electrical Engineering, Entomology, Forestry, Home Economics, Horticulture, Mathematics, Mechanical Engineering, Physics, Poultry Science, and Zoology leading to the Master of Science degree; Economics, English, Government, History, Language, Psychology, and Sociology leading to the Master of Arts degree; and Education leading to the Master of Education degree. Programs also are available leading to the Master of Agricultural Education degree and to the Master of Science for Teachers degree. Graduate programs leading to the Doctor of Philosophy degree are offered in the Departments of Botany, Chemistry, Horticulture, and Zoology.

Assistantships, Scholarships, and Fellowships

Graduate assistantships are available in several departments. These involve work in research, teaching, general service, or some combination thereof. Scholarships are also available which provide exemption of tuition charges. A limited number of fellowships provided by the National Defense Education Act of 1958 are available in Botany, Chemistry, and Zoology.

Information

Detailed information about admission, requirements for degrees, courses, fellowships, scholarships, and assistantships are to be found in the Graduate School catalogue which may be obtained by writing to the Dean of the Graduate School.

Description of Courses

EXPLANATION OF ARRANGEMENT

The title of the course is given in small capital letters; the arabic numeral designates the particular course. Odd numerals indicate courses normally offered in the first semester; even numerals indicate courses normally offered in the second semester. Arabic numerals enclosed in parentheses indicate that a course is repeated in the semester following. Thus course 1 (1) is offered in the first semester and is repeated in the second semester.

Every course is assigned to one of 24 examination groups. As all courses in the same examination group have their final examinations at the same time, a student may not register for two courses with the same examination number. Courses with examination group number 0 have no final examination, so that more than one course in this group may be scheduled by a student. For the examination group number of each course, see the time and room schedule.

Courses numbered 1-50 cannot be counted for graduate credit. Courses numbered 51-99 are for the juniors, seniors, and graduate students. They are not open to freshmen and sophomores. Descriptions of courses over 100, which are for graduate students only, will be found in the Graduate School catalogue.

Following the title is the course description and the name of the instructor. The next section gives the following information in the order indicated: (1) prerequisites, if any; (2) the number of hours of recitations or laboratory periods required each week; (3) the number of semester credits the course will count in the total required for graduation. Lectures and recitations are fifty minutes in length. Laboratory periods are usually two and one-half hours in length.

Abbreviations have been employed to indicate the number of hours of work required of students in lecture, recitation, and laboratory, and the number of credits given for satisfactory completion of each course. The abbreviations should be interpreted as follows:

Cr.	Semester hour credit
Lab.	Laboratory
Lec.	Lecture
Prereq.	Prerequisites
Rec.	Recitation

All courses (unless otherwise marked) are open to students who have passed the prerequisites.

An elective course may be given only when there is a minimum of five students registered.

If the numerals designating a course running through both semesters are connected by a hyphen, the first semester, or its equivalent, is a prerequisite for the second semester. If the numerals are separated by a comma, properly qualified students may take the second semester without having had the first.

Students must register for the number of credits or within the range of credits shown in the catalogue description of a course.

UNIVERSITY OF NEW HAMPSHIRE

AGRICULTURE

A grouping of non-departmental courses

DEAN'S OFFICE, COLLEGE OF AGRICULTURE

1. ORIENTATION. A non-departmental course offering matters not ordinarily reviewed in other courses of instruction. Attention will be given to selected student rules and regulations, scholarships, campus organizations and facilities, opportunities in agriculture as a science, and to programs of study. Also, federal aid as related to land-grant colleges and universities will be discussed. Mr. Richards. Required of first-semester freshmen in Agriculture, Forestry, and Home Economics. 1 lec.; 1 cr.

COOPERATIVE EXTENSION SERVICE

3. PRINCIPLES OF COOPERATIVE EXTENSION WORK. The development, legal basis, description of projects and operations of field staff, methods of influencing people through meetings, demonstrations, publicity, radio, and visual aids. Mr. James and other members of the staff of the Cooperative Extension Service. Open to juniors and seniors in Agriculture and Home Economics by permission of the instructor. (Alternate years; not offered in 1961-62.) 2 lec.; 2 cr.

4. EXTENSION FIELD WORK. To provide practical experience in extension work, a limited number of Agriculture and Home Economics students may be permitted to do some supervised extension work under the immediate direction of a member of the staff of the Cooperative Extension Service. This may be taken during the second semester of the junior or senior year. In some cases arrangements may be made for supervised work during the summer vacation period. Preference may be given to students who have taken Agriculture 3. Mr. James. 2 to 6 cr.

AGRICULTURAL EDUCATION

89-90. METHODS OF TEACHING FARM MECHANICS IN VOCATIONAL AGRICULTURE. The organization and presentation of farm mechanics subject matter, supervision and direction of farm mechanics projects, and the preparation and presentation of demonstrations. The first semester deals with fundamental farm mechanics skills and the second semester with farm machinery maintenance and operational techniques of instruction. Mr. Gilman. Required of majors in Teacher Preparation curriculum. 1 lab.; 1 cr.

91-92. PROBLEMS IN TEACHING VOCATIONAL AGRICULTURE. The vocational point of view, building the course of study in agriculture, providing teaching facilities, planning the lesson, and planning supervised farming programs. Future Farmers of America, young farmer program, adult farmer programs, and miscellaneous activities of the teacher of agriculture. Mr. Barton. Required of juniors or seniors in Teacher Preparation curriculum. 2 lec.; 1 lab.; 3 cr.

93, (93). SUPERVISED TEACHING IN VOCATIONAL AGRICULTURE. This course provides participating experience in teaching vocational agriculture under the guidance of a critic-teacher. The enrollee is required to assume the duties and responsibilities expected of the regular teacher of agriculture before the work for the semester is concluded. Mr. Barton. 17 cr.

DESCRIPTION OF COURSES

AGRICULTURAL ECONOMICS

WILLIAM F. HENRY, *Professor*; JAMES R. BOWRING, *Professor*; WILLIAM H. DREW, *Associate Professor*; RICHARD A. ANDREWS, *Assistant Professor*

12. **ECONOMICS OF AGRICULTURE.** A survey of economics as related to the agricultural industry. Includes the nature of farming costs and farm prices, the economics of marketing, the economic bases of consumer decision making, and agricultural policy. Mr. Henry. 3 lec.; 3 cr.

14. **FARM MANAGEMENT.** Principles of managing farms for maximum income, including methods of making management decisions; enterprise selection and resource combination; adjustment to prices; management of land, labor, and equipment; obtaining capital; farm planning; records and analysis of performance. The principles are applied to several kinds of farms through examples, laboratory problems, and farm visits. Open to juniors and seniors. Mr. Andrews. 3 lec.; 1 lab.; 4 cr.

34. **ECONOMICS OF CONSUMPTION.** The significance of consumer decisions about spending and saving to the economy. Budgeting and decision making in the major categories of consumer purchases. Factors influencing consumer choice, including prices, grades, and standards. Changing food needs and their relation to production and marketing problems. Problems of maximizing consumer satisfaction. Mr. Bowring. Prereq.: Econ. 1. 3 lec.; 3 cr.

51. **AGRICULTURAL BUSINESS.** The organizational, legal, and financial aspects of businesses engaged in buying farm products and selling farm supplies. Farm cooperatives are covered as a special case. Agricultural marketing problems are integrated with the course content. Mr. Henry. 3 lec.; 3 cr.

54. **AGRICULTURAL FINANCE.** The capital needs of different kinds of farms and farmer organizations. Saving, credit, renting, partnerships, and other means of obtaining capital. Organization, practices, and problems of credit institutions serving agriculture. The valuation and appraisal of farm property. Mr. Andrews. Prereq.: Ag. Econ. 14 or concurrently. 2 lec.; 2 cr. (Alternate years; offered 1961-62.)

55. **AGRICULTURAL MARKETING.** The market structure for the distribution of agricultural products will be reviewed. Attention will be given to consumer demand, prices, and the efficiency of firms handling farm products. Each student is encouraged to study in detail a product of his or her particular interest. Mr. Bowring. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

61. **AGRICULTURAL POLICY.** Problems which are the basis for government and private policies in the production and marketing of agricultural products. Prices, production controls, marketing agreements, conservation, and farm credit are appraised relative to the objectives of agriculture and the concept of general welfare. Prereq.: 6 hours of Economics or Agricultural Economics. Mr. Drew. 3 lec.; 3 cr.

67, 68. **SPECIAL PROBLEMS.** Special assignments in reading and problems to satisfy students' needs. Mr. Henry, Mr. Bowring, Mr. Drew, and Mr. Andrews. Prereq.: special permission. 1 to 3 cr.

72. **RESEARCH METHODOLOGY.** The scientific method of research for advanced students. Emphasis will be placed on the meaning of logic and

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

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the scientific method and on the application of research techniques to identifying and solving problems of agriculture. Prereq.: 3 hours of statistics. Mr. Drew. 3 lec.; 3 cr.

AGRICULTURAL ENGINEERING

JOHN J. KOLEGA, *Associate Professor*; GORDON L. BYERS, *Associate Professor*; PAUL A. GILMAN, *Associate Professor of Farm Mechanics, Thompson School of Agriculture*

2. RESIDENCE PLANNING. The considerations involved in building or buying a house to fit one's needs. Problems in selecting and applying typical materials to residence construction. Mr. Kolega. 1 lec.; 1 lab.; 2 cr.

15. AGRICULTURAL ENGINEERING SHOP. An appreciation of the problems of manufacturing and repair. Practice in oxy-acetylene and electric arc welding, machining and cold metal work, soldering, pipe fitting, and the care and use of woodworking tools. Mr. Gilman. Registration limited to Agricultural Engineering students. 1 lab.; 1 cr.

17, 18. FARM SHOP. The selection, care, and use of tools needed for modern farm operation and maintenance, with practice in basic tool operations. The development of skills in handling tools for maintenance and construction work on the farm. Mr. Gilman. 2 labs.; 2 cr.

21. SOIL AND WATER CONTROL. Elementary surveying and its application to agricultural problems. The design principles, mapping, and layout of drainage, erosion control, and irrigation systems along with the presentation of construction practices for farm ponds, diversion ditches, terraces, and other mechanical methods of water control. Farmstead water systems and pumps are included. Mr. Byers. 2 lec.; 1 lab.; 3 cr.

22. AGRICULTURAL POWER. Tractors, tractor engines, and electrical energy in farm work. The factors involved in the management, preventive maintenance, and repair procedures required by tractor motors and their power transmission systems. Mr. Byers. 2 lec.; 1 lab.; 3 cr.

23. AGRICULTURAL MACHINERY. The selection, care, operation, and management of conventional farm machinery and processing equipment involved in the production of farm commodities. Mr. Byers. 2 lec.; 1 lab.; 3 cr.

24. AGRICULTURAL BUILDINGS. The planning and design of agricultural structures for animals and crops. Construction practices, farmstead layout, building material selection and application, material estimates, heating systems, lighting, refrigeration, sewage disposal, ventilation, environmental controls, certain phases of crop processing, and basic concepts of architectural drafting are introduced. An agricultural building problem, related to the student's major or field of interest, serves as the base for the application of all principles presented in lecture. Mr. Byers. 2 lec.; 1 lab.; 3 cr.

Note: Courses 31 through 40 are primarily for Agricultural Engineering majors and Technology students.

31. SOIL AND WATER ENGINEERING. The hydrologic, soil, vegetal, and stream flow factors involved in the design and operation of erosion control structures, drainage systems, and irrigation systems. Mr. Kolega. Prereq. or concurrently: C.E. 52. 2 lec.; 1 lab.; 3 cr.

32. FARM TRACTORS. The design and operation of farm tractors, tractor power units, chassis mechanics, tractor tests and performances. Mr. Byers.

DESCRIPTION OF COURSES

Prereq. or concurrently: M.E. 26; M.E. 33. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

33. FIELD MACHINERY. The design of the engineering elements of farm machinery; capacity and power requirements of farm implements. Mr. Byers. Prereq. or concurrently: M.E. 26. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

34. AGRICULTURAL STRUCTURES. The functional planning and structural design of farm buildings; problems arising from the physiological processes of animals and crops. Mr. Kolega. Prereq. or concurrently: M.E. 33, M.E. 35. 2 lec.; 1 lab.; 3 cr.

35. RURAL ELECTRIFICATION. The utilization of electrical energy on farms for power, illumination, and temperature control, including the study of equipment used in crop processing water systems, materials handling, and the design of a farmstead wiring system. Mr. Kolega. Prereq. or concurrently: E.E. 39. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

41, 42. SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. Guided but independent activities in special areas of agricultural engineering by students capable of self-direction. Prereq.: senior standing. 1-3 cr.; time to be arranged.

AGRONOMY

ALLAN B. PRINCE, *Professor*; FORD S. PRINCE, *Professor Emeritus*; LEROY J. HIGGINS, *Associate Professor*; NOBEL K. PETERSON, *Associate Professor*; GERALD M. DUNN, *Associate Professor*

Crops

1. INTRODUCTORY CROP PRODUCTION. The production, distribution, cultural practices, improvement, and uses of field crops, such as forage, grain, and tuber crops. Mr. Higgins. 2 lec.; 1 lab.; 3 cr.

25. SEED TESTING. The identification of seeds and the techniques used in official methods of sampling and analyzing agricultural seeds for purity and germination. Mrs. Sanborn, Seed Analyst. Prereq.: Bot. 1 and permission of instructor. 1 lab.; 1 cr.

26. PRODUCTION OF ROW AND OTHER ANNUAL CROPS. The characteristics and fundamentals of production of row and drilled crops, with emphasis on corn, potatoes, and other cereal crops. Mr. Higgins. 2 lec.; 1 lab.; 3 cr.

(51). PASTURE-HAY CROPS AND TURF. The grasses and legumes used as hay, pasture, and silage, and the methods used in the production of high quality forage. Consideration also will be given to turf grasses and management for lawns and turfs. Mr. Higgins. Prereq.: Permission of instructor. 3 lec.; 1 lab.; 4 cr.

62. BREEDING OF FIELD CROPS. Methods for developing and evaluating improved varieties of grasses, legumes, and cereal crops. Major emphasis will be given to corn breeding. Laboratory will consist of practical work in selfing and crossing, inheritance studies, and statistical analysis of experimental plot designs. Mr. Dunn. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1961-62.)

UNIVERSITY OF NEW HAMPSHIRE

Soils

11. **INTRODUCTORY SOILS.** The physical, chemical, and biological properties of soils in relation to plant growth. Mr. Peterson. 3 lec.; 1 lab.; 4 cr.

14. **INTRODUCTORY SOIL FERTILITY.** Soils in relation to their natural fertility, productivity, and the practices and amendments employed to maintain or increase fertility. Mr. Peterson. Prereq.: Agron. 11. 3 lec.; 3 cr.

57. **PHYSICS AND CHEMISTRY OF SOIL.** Physical and chemical properties of soils; their measurement and relation to structure; water movement; temperature; and liberation, absorption, and fixation of elements in soils. Mr. Prince. Prereq.: Permission of instructor. 3 lec.; 2 lab.; 5 cr. (Alternate years; not offered in 1961-62.)

58. **SOIL CLASSIFICATION AND MAPPING.** The genesis, morphology, classification, and mapping of soils. Mr. Peterson. Prereq.: Agron. 11 and Geol. 7. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1961-62.)

60. **SOIL AND WATER CONSERVATION.** Management of soil and water in accordance with the needs and capabilities of the land. Mr. Peterson. Prereq.: Agron. 1, 11. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered in 1961-62.)

General Courses

52. **A REVIEW OF AGRONOMY.** Principles and practices in agronomic crop production, including the management of soils and the use and response of lime and fertilizers. For teachers of Vocational Agriculture and other students with the permission of their advisers. Mr. Higgins and staff. Summer Session only—offered in 1961. Two hours daily, lec. and lab.; 2 cr.

71, 72. **AGRONOMY SEMINAR.** Library and reference work on special phases of soil and crop problems. Practice in looking up literature and in preparation and presentation of reports and abstracts. Staff. Required each semester of seniors and graduate students majoring in Agronomy; elective for other qualified students. 1 cr.

75, 76. **INVESTIGATIONS IN:**

- a. Crop Production — Mr. Higgins
- b. Plant Breeding — Mr. Dunn
- c. Physics and Chemistry of Soil — Mr. Prince
- d. Soil Fertility — Mr. Peterson

Elective only after consultation with the instructor in charge. Hours to be arranged. 1-4 credits.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

ANIMAL SCIENCE

LORING V. TIRRELL, *Professor*; FRED E. ALLEN, *Professor*; GERALD L. SMITH, *Associate Professor*; HAROLD E. KIMBALL, *Riding Instructor*

2. **TYPES AND MARKET CLASSES OF LIVESTOCK.** Origin, history, development, characteristics, and adaptability of the different types of horses, cattle, sheep, and swine, with practice in judging. Mr. Tirrell and Mr. Smith. 2 lec.; 1 lab.; 3 cr.

DESCRIPTION OF COURSES

11. **LIVESTOCK JUDGING.** The principles and practice of judging horses, beef cattle, sheep, and swine. It includes trips to some of the best New England breeding establishments and is required of candidates for judging teams. Mr. Smith. 1 lab.; 1 cr.

13. **FEEDS AND FEEDING.** The character, composition, and digestibility of feed stuffs and the principles and methods of feeding different kinds of farm animals. Mr. Smith. 3 lec.; 3 cr.

14. **ADVANCED LIVESTOCK JUDGING.** A continuation of Animal Science 11. It serves as a basis for the selection of a livestock team for competition such as held at the Eastern States Exposition and the International Livestock Exposition at Chicago. Mr. Smith. Prereq.: An Sci. 11. 1 lab.; 1 cr.

15. **SYSTEMATIC ANATOMY.** The general anatomy and physiology of domestic animals. Mr. Allen. 3 lec.; 3 cr.

16. **ANIMAL DISEASES.** The prevention, control, and treatment of the bacterial and parasitic diseases of domestic animals. Mr. Allen. Prereq.: An. Sci. 15. 3 lec.; 3 cr.

18. **MEAT AND ITS PRODUCTS; LIVESTOCK MARKETS.** Meat, farm slaughter, curing, and identification of cuts, livestock markets, stockyards, and transportation, with occasional trips to slaughter houses and packing plants. Mr. Smith. 1 lec.; 1 lab.; 2 cr.

19. **MANAGEMENT OF BEEF CATTLE AND SWINE.** Selection, feeding, breeding, management, and preparation for the show ring of beef cattle and swine with special reference to New England conditions. Mr. Tirrell and Mr. Smith. 2 lec.; 1 lab.; 3 cr.

20. **SHEEP HUSBANDRY.** Selection, breeding, feeding, management, and preparation for the show ring of sheep, with special reference to New England conditions. Mr. Tirrell and Mr. Smith. 2 lec.; 1 lab.; 3 cr.

21. **LIGHT HORSE HUSBANDRY.** Origin, history, development, judging, selection, feeding, breeding, and management of light horses. Special emphasis will be placed upon saddle-horse selection, the show ring classes, and judging. Horse show management will be discussed. Mr. Tirrell and Mr. Smith. 1 lec.; 1 lab.; 2 cr.

23, (23). **HORSEMANSHIP.** Instruction in riding using University-owned Morgans under supervision of a special riding instructor. It may be possible for a limited number of students to stable their horses at the University upon proper authorization. Any student wishing to use this course to satisfy an activity requirement in Physical Education for Women will register for Physical Education 1, 2, 3, 4, 5 or 6. Two one-hour or one two-hour riding periods per week for which a fee of \$35 per quarter is charged. Mr. Kimball. 1 cr.

51. **ANIMAL BREEDING.** The principles and practices of breeding farm animals, including cross-breeding, in-breeding, selection, inheritance, breed analysis, reproductive efficiency, fertility and sterility. Mr. Smith. 3 lec.; 3 cr.

52. **ANIMAL SCIENCE SEMINAR.** Library and reference work and preparation of papers on various Animal Science subjects. Mr. Tirrell. 1 to 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

UNIVERSITY OF NEW HAMPSHIRE

THE ARTS

GEORGE R. THOMAS, *Professor*; JOHN W. HATCH, *Associate Professor*; RICHARD D. MERRITT, *Assistant Professor*; JOHN LAURENT, *Assistant Professor*; WINIFRED CLARK, *Assistant Professor*; JAMES A. FASANELLI, *Assistant Professor*; R. VIRGINIA BELL, *Instructor*; CHRISTOPHER C. COOK, *Instructor*; DANIEL L. VALENZA, *Instructor*; ALFRED R. POTTER, *Instructor*; HUGH PRITCHARD, *Visiting Lecturer*

VISITING LECTURERS IN CLINICAL SUBJECTS

WILLIAM AMMAN, M.D., *Ophthalmology and Otology*; ARTHUR DI MAMBRO, M.D., *Physical Disabilities*; CHARLES H. HOWARTH, B.S., M.D., *General Medical and Surgical Conditions, Tuberculosis*; GERHARD NOTHMANN, M.D., *Psychiatry*; GERALD SHATTUCK, M.D., *Pediatrics*.

SUPERVISORS IN CLINICAL AFFILIATION

MISS JOY ANDERSON, MISS CLARI BARE, MRS. LOTTIE BARTH, MISS MARGARET BLODGETT, MISS ELIZABETH BOLES, MISS RUTH BRUNYATE, MISS MARJORIE CANADA, PAUL CLARK, MISS EILEEN DIXEY, MISS MARY FIORENTINO, MISS RENA GRAHAM, MRS. GERTRUDE GRENIER, MISS FRANCES HELMIG, HARRY KROMER, PERCY LARRABEE, MISS CLOTILDA MATENY, MRS. ARVILLA MERRILL, MISS EILEEN O'HEARN, MISS CECILIA SATTELY, MISS MIRIAM SCANLAN, SISTER MARY LAURENTANA, MISS NANCY SCOTT, MISS ELIZABETH STANLEY, MISS JANET STONE, MISS VIOLA SVENSSON, MISS NANCY VESPER, MISS ELLA WESTERMAN, MISS RUTH ZIEKE.

EXHIBITIONS AND ART TRIPS. The Department promotes on the campus a series of exhibitions and lectures relating to the arts. Visits to near-by museums and points of interests are arranged from time to time. The following are a few of the art centers within a convenient radius of Durham: Addison Gallery of American Art, Currier Gallery of Art, Lamont Gallery, and several excellent museums and galleries in Boston, including the Boston Museum of Fine Arts, the Gardner Museum, the Fogg Museum at Harvard University, and the Institute of Contemporary Art.

STUDENT WORKSHOP. An experimental arts laboratory located in Hewitt Hall, is open to any student in the University, whether or not enrolled in art courses. This laboratory provides an excellent environment in which a student may explore materials, plan, and execute projects of his own choice. Excellent facilities, including equipment ranging from small craft tools to industrial type machines, are provided. Mr. Valenza.

GENERAL COURSES IN THE ARTS

In those courses where the students retain finished products, they pay the costs of materials and supplies used. The Department of The Arts reserves the right to retain for exhibition purposes several examples of each student's work in each class of instruction.

Students are responsible for the care of shops, studios, and all equipment therein; damage resulting through negligence or carelessness will be the responsibility of the student. Tools and other equipment will not be used until instruction in their use is given by the member of the staff in charge.

DESCRIPTION OF COURSES

Unless otherwise authorized by the Chairman of the Department, projects not a part of the instructional program will be excluded from the studios.

3. CRAFTS. Work in leather, metal tooling, chip carving, and other crafts which require little special equipment and which may be carried on in elementary and secondary schools. Problems in design, methods of teaching each craft, sources of materials and tools, and current literature. Miss Clark. *For Art-Education students*; also, elective by permission. 2 lab.; 2 cr.

4. CRAFTS. Craft activities for summer camps, playgrounds, settlement and scout groups. Design and construction in leather, paper, wood, textiles, scrap, and native materials. Special emphasis on methods of teaching and using crafts in camp handcraft programs, sources of materials and tools, and current literature. Miss Clark. *For Recreation Education, Physical Education, and Social Service students*; also, elective by permission. 2 lab.; 2 cr.

5, (5). JEWELRY AND METALWORK. Structural and decorative design and construction in various metals, such as pewter, copper, and silver. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than four times.* Miss Clark. Elective by permission. 2 lab.; 2 cr.

(6). WEAVING. Fundamentals of weaving: warping, threading, basic weaves, patterns. Projects include place mats, scarves, bags, rugs, etc. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than four times.* Miss Clark. Elective by permission. 2 lab.; 2 cr.

(8). TEXTILE DESIGN. Creative design in stenciling, block printing, silk screen printing. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than four times.* Miss Clark. Elective by permission. 2 lab.; 2 cr. (Not offered 1961-62.)

11, (11). SCULPTURE. An introduction to three dimensional expressive form. Studio work in various sculpture materials (clay, wood, metal, plaster) including exploration of the processes of modeling, carving, casting, welding, firing, and glazing. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than three times.* Elective by permission. 2 lab.; 2 cr.

15, 16. CERAMICS. Design and construction of three dimensional forms, with emphasis upon coil and slab built functional and non-functional pottery. Studio practice in clay preparation, glazing, and kiln firing. Directed glaze and glaze material experiments. Kiln procedures are explained and the student is expected to participate in stacking and firing. Group demonstrations and individual instruction. Mr. Potter. Elective by permission. 2 lab.; 2 cr.

17, 18. CERAMICS. Exploration of three dimensional forms in clay, with emphasis upon wheel-thrown functional and non-functional pottery. Studio practice in clay preparation, glazing, and kiln firing. Directed glaze and glaze material experiments. Kiln procedures are explained and the student is expected to participate in stacking and firing. Group demonstrations and individual instruction. Advanced students may be assigned individual problems. Mr. Potter. Elective by permission. 2 lab.; 2 cr.

20. DRAFTING AND SPACE PLANNING. Basic drafting procedures, including lettering. Study of architectural symbols and interpretation of architectural plans. Introduction to problems of architectural design, with emphasis on

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those relating to the hotel industry. Assigned problems in space utilization and space planning. Mr. Thomas. *For Hotel Administration students, elective by permission only.* 1 lec.; 2 lab.; 3 cr.

23, (23). **BASIC DESIGN.** A basic course in the structural and expressive use of the elements of design as a background for crafts, ceramics, drawing and painting, and commercial design. A series of related lectures and demonstrations will be scheduled throughout the semester. Miss Clark, Mr. Hatch, Mr. Laurent and Mr. Cook. Elective by permission. 1 lec.; 2 lab.; 2 cr.

24. **DRAWING AND DESIGN.** A continuation of Arts 23 with problems in three dimensional design and drawing from the model and from nature. Mr. Hatch, Mr. Laurent and Mr. Cook. Prereq.: Arts 23 and permission. 2 lab.; 2 cr.

25, 26. **ADVANCED DRAWING AND PAINTING.** Drawing is concentrated in the fall semester; extensive drawing in studio and from nature, still life and figure drawing in a variety of media, i.e., pencil, pen, ink and wash, pastel, and watercolor. An introduction to oil painting composition, means of form description, and theories of color are presented in studio exercises and outdoor sketching in the spring semester. Mr. Hatch, Mr. Laurent and Mr. Cook. Elective by permission only. 2 lab.; 3 cr.

27. **GRAPHIC ARTS.** Expression and experimentation in a variety of graphic techniques, i.e., linoleum and wood block printing, etching, lithography, serigraphy, etc., in black and white and color. Mr. Laurent. Elective by permission only. 2 lab.; 3 cr.

28. **ADVERTISING DESIGN.** Creative design problems in various media and techniques in an introduction to the field of advertising design. Mr. Hatch. Elective by permission only. 2 lab.; 2 cr.

29, 30. **ADVANCED PAINTING AND COMPOSITION.** An extension of Arts 25 and 26, stressing further development in the various media. Figure study and outdoor sketching also will be included. This course may be taken a second time with emphasis on the particular need of the individual. Mr. Laurent. Elective by permission only. Credits and schedule to be arranged.

31, 32. **INTRODUCTION TO THE ARTS.** A broad historical survey of man's creative efforts in their relation to contemporary cultural and social movements, presented as a background for interpreting the place of the arts in individual and community life of today. Illustrated lectures with assigned readings. Mr. Thomas and Mr. Fasanelli. *Not open to freshmen.* 3 lec.; 3 cr.

38. **ILLUSTRATION.** Creative design problems in various media and techniques in an introduction to the field of illustration. Elective by permission only. 2 lab.; 2 cr. (Alternate years; not offered 1961-62.)

39, (39). **ELEMENTARY PHOTOGRAPHY.** The theory and practice of photography, covering camera operation, developing, printing, and enlarging. Projects stress imaginative solutions to portraiture, advertising, illustrative, and campus life assignments. Mr. Merritt. *Not open to freshmen.* Elective by permission only. 1 lec.; 1 lab.; 3 cr. (The cost of materials will approximate \$8.00.)

40. **ADVANCED PHOTOGRAPHY.** The basic theory and practice of color photography. Advanced projects in black and white. Techniques of creative photography including studio and laboratory controls. A portfolio of photographs, representative of the student's progress during the course, will be required. Mr. Merritt. Permission of the instructor. 1 rec.; 1 lab.;

DESCRIPTION OF COURSES

3 cr. (The cost of materials will approximate \$10.50.) (Alternate years; offered in 1961-62.)

83. PRIMITIVE, ORIENTAL, AND CLASSIC ART. Primitive art from prehistoric caves to Egypt, also Mayan, Negro, and modern primitive arts in general; the development of art in the Far East, especially China and Japan; the development and decline of the classic art of Greece and Rome. The motivation, the relationship to the particular culture, and the influence on modern art of these various art epochs will be stressed. Illustrated lectures with assigned readings. Mr. Hatch. 3 lec.; 3 cr. (Alternate years; offered in 1961-62.)

85. THE ART OF THE RENAISSANCE. A historic survey of the achievements of Western civilization in sculpture, painting, and architecture from the Gothic cathedral to the 18th century drawing room. Illustrated lectures with assigned readings. Mr. Fasanelli. 3 lec.; 3 cr. (Alternate years; offered in 1961-62.)

88. MODERN ART. From Louis XVI to Picasso; traces the history of painting through the various revolutions, political and aesthetic, that resulted in the many schools of thought prevalent in 19th and 20th century art; i.e., classicism, impressionism, cubism, etc. Illustrated lectures with assigned readings. Mr. Fasanelli. 3 lec.; 3 cr.

99, (99). PROBLEMS IN THE VISUAL ARTS. Advanced students may select a special problem in one of the visual arts in which they have exhibited proficiency, to be developed by means of conferences and studio work. Mr. Thomas and staff. Prereq.: Permission of Department Chairman. Credits to be arranged. *This course may be repeated to a total of not more than 6 credits.*

ART-EDUCATION (ART-ED.) 91. PROBLEMS OF TEACHING ART IN ELEMENTARY SCHOOLS. The purposes and objectives of teaching art in elementary schools; selection and organization of teaching material; teaching techniques which may be advantageously employed in the elementary schools. Mr. Thomas. Open only to students in the Art-Education curriculum. Prereq.: Educ. 58 with grade of C or better. 2 rec.; 1 lab.; 3 cr.

ART-EDUCATION (ART-ED.) (92). PROBLEMS OF TEACHING ART IN SECONDARY SCHOOLS. The purpose and objectives of teaching art in the secondary schools; selection and organization of teaching materials; teaching techniques which may be advantageously employed in the secondary-school art program. Mr. Thomas. Open only to students in the Art-Education curriculum. Prereq.: Educ. 58 with a grade of C or better. 2 rec.; 1 lab.; 3 cr.

EDUCATION-ART (ED-ART) 94. SUPERVISED TEACHING IN ART. Prereq.: Art-Ed. 92. One semester of supervised teaching. 14 cr.

Selection from the following courses offered by several departments within the University may, with the consent of the Chairman of the Department and the College Dean, be counted toward a major program in The Arts.

COSTUME DESIGN. *See* HOME ECONOMICS

FLORAL ARRANGEMENT. *See* HORTICULTURE

FUNDAMENTALS OF FASHION. *See* HOME ECONOMICS

HISTORY OF COSTUME. *See* HOME ECONOMICS

INTERIOR DESIGN. *See* HOME ECONOMICS

INTERIOR DECORATION. *See* HOME ECONOMICS

PRINCIPLES OF CLOTHING CONSTRUCTION. *See* HOME ECONOMICS

TEXTILES. *See* HOME ECONOMICS

TEXTILES AND FURNITURE. *See* HOME ECONOMICS

For courses in music, dramatic art, and dancing, see departments of Music, Speech and Drama, and Physical Education for Women.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

BACTERIOLOGY

LAWRENCE W. SLANETZ, *Professor*; THEODORE G. METCALF, *Associate Professor*; WILLIAM CHESBRO, *Assistant Professor*

1. GENERAL BACTERIOLOGY. Principles of bacteriology; morphology, physiology, and classification of bacteria and other microorganisms, and their relationship to agriculture, industry, sanitation, and infectious diseases. Mr. Slanetz, Mr. Metcalf, and Mr. Chesbro. Prereq.: Chem. 1-2 or equivalent. 2 lec.; 2 lab.; 4 cr.

2. FOOD AND SANITARY BACTERIOLOGY. Relation of microorganisms to food production; food preservation; food infections and intoxications; standard laboratory methods for the bacteriological examination of foods. Bacteriology and sanitation of milk, water, sewage, air, and eating utensils. Disinfection and disinfectants. Mr. Slanetz and Mr. Chesbro. Prereq.: Bact. 1. 2 lec.; 2 lab.; 4 cr.

5. PUBLIC HEALTH AND SANITATION. The nature and types of microbes causing infectious diseases; the prevalence, transmission, and control of these diseases. Sanitation of water, sewage, food, and air. Community hygiene and public health administration. Mr. Slanetz. Prereq.: Biol. 1-2, or consent of instructor. 3 lec. or demonstrations; 3 cr.

6. SOIL BACTERIOLOGY. The nature and types of bacteria and other microorganisms present in soil and their activities in carrying out decomposition of plant and animal matter; their role in the nitrogen, carbon, and sulfur cycle in soil; their relationship to other soil inhabitants; and their contribution to soil fertility. Mr. Chesbro. Prereq.: Bact. 1. 2 lec.; 2 lab.; 4 cr. (Alternate years; offered in 1961-62.)

8. PATHOGENIC BACTERIOLOGY. The morphological, cultural, biochemical, serological, and pathogenic characteristics of microorganisms causing human and animal diseases. Mr. Metcalf. Prereq.: Bact. 1. 2 lec.; 2 lab.; 4 cr.

53. IMMUNOLOGY AND SEROLOGY. The theories of infection and immunity; production of vaccines, toxins, and antisera; serological techniques for disease diagnosis and identification of bacteria, including agglutination, precipitin, and complement fixation tests. Mr. Metcalf. Prereq.: Bact. 8. 2 lec.; 2 lab.; 4 cr.

54. INDUSTRIAL MICROBIOLOGY. Microorganisms important in industrial processes. Isolation and study of the bacteria, yeasts, molds, and actinomycetes used for the manufacture of industrial products. Discussion of the theoretical aspects of fermentation and respiration and their practical applications. Typical industrial processes employing microorganisms. Mr. Chesbro. Prereq.: Bact. 1 and organic chemistry. 2 lec.; 2 lab.; 4 cr. (Alternate years; not offered 1961-62.)

DESCRIPTION OF COURSES

55, 56. PROBLEMS IN BACTERIOLOGY. Special problems, depending upon the training and desire of the student. Elective only upon consultation. Mr. Slanetz and members of the staff. Credits to be arranged.

57, 58. BACTERIOLOGY SEMINAR. Reports and discussions on current literature and recent developments in bacteriology. Mr. Slanetz and members of the staff. Prereq.: Bact. 2 or 8 and consent of the instructor. 1 2-hr. period; 1 cr.

60. VIROLOGY. The animal and plant viruses including bacteriophages and the rickettsiae. A consideration of techniques, pathogenesis, immunity, and host-virus relationships. Mr. Metcalf. Prereq.: Bact. 8. 1 lec.; 3 lab.; 4 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

ACCOUNTING

(See *Economics and Business Administration*)

BIOCHEMISTRY

ARTHUR E. TEERI *Professor*; THOMAS G. PHILLIPS, *Professor Emeritus*;
STANLEY R. SHIMER, *Professor*; MARGARET E. LOUGHLIN, *Assistant Professor*;
DOUGLAS G. ROUTLEY, *Assistant Professor*

1. ORGANIC AND BIOLOGICAL CHEMISTRY. An introduction to organic chemistry and a brief survey of biological chemistry. Mr. Shimer, Miss Loughlin. Prereq.: Chem. 2 or 4. 3 lec.; 2 lab.; 5 cr.

2. PLANT CHEMISTRY. The chemistry of plant growth. Mr. Routley. Prereq.: Biochem. 1 or its equivalent. 2 lec.; 1 lab.; 3 cr.

4. ANIMAL NUTRITION. The chemistry of animal nutrition. Mr. Shimer. Prereq.: Biochem. 1 or its equivalent. 2 lec.; 1 lab.; 3 cr.

6. CHEMISTRY OF FOOD AND NUTRITION. The chemistry of food materials and of digestion, absorption, metabolism, and excretion. Miss Loughlin. Prereq.: Biochem. 1 or its equivalent. 2 lec.; 1 lab.; 3 cr.

51-52. GENERAL BIOCHEMISTRY. The chemistry of fats, carbohydrates, and proteins; colloids, enzymes, digestion, metabolism, and excretion. Mr. Shimer, Mr. Teeri. Prereq.: Satisfactory preparation in organic chemistry and quantitative analysis. 3 lec.; 2 lab.; 5 cr. Under special conditions a graduate student may register for the lectures in this course (3 cr.) after obtaining the consent of the instructor and approval of his adviser.

56. PHYSIOLOGICAL CHEMISTRY. The qualitative and quantitative methods fundamental to medical diagnostic work. The chemistry of fats, carbohydrates, and proteins; enzymes, digestion, metabolism, and excretion. Mr. Teeri. Prereq.: Satisfactory preparation in organic chemistry and quantitative analysis. 3 lec.; 2 lab.; 5 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
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BIOLOGY

1-2. **MAN AND THE LIVING WORLD.** A basic course in biology, designed to give the student fundamental facts about himself and an understanding of his relation to the living world, both plant and animal, of which he is a part. 2 rec.; 1 lab.; 3 cr. *This course cannot be used to satisfy majors requirements.* (Not open to students who have credit for Bot. 1 and Zool. 48.)

3. **MAN AND THE LIVING WORLD.** An advanced-standing course open to freshmen and sophomores who have had good background in high school biology and elementary physical sciences. During orientation week a pre-test covering these areas will be given to those students who wish to enroll in this course. Admission to Biology 3 will have the effect of waiving three hours of the six credit hours required in the biological sciences. Further information concerning admission to this section can be obtained from Mr. George M. Moore. 2 rec.; 1 lab.; 3 cr.

61-62. **CLINICAL LABORATORY METHODS.** An 11-month course in medical technology taken at the Mary Hitchcock Memorial Hospital School of Medical Technology, Hanover, New Hampshire. This course starts about June 20, and includes lectures and laboratory work in bacteriology, blood bank and serology, clinical chemistry, hematology, laboratory management and ethics, mycology, parasitology, histology, and clinical microscopy. Credits will be allowed when the University has received a transcript of the candidate's record and upon certification by the Director of the School and the Supervisor of the Medical Technology curriculum that the work has been successfully completed. This course qualifies a candidate for the examination for the Medical Technologist's Certificate administered by the Registry of Medical Technologists of the American Society of Clinical Pathologists. 32 cr. *This course cannot be taken for graduate credit.*

BIOLOGY-EDUCATION (BIOL-ED.) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL BIOLOGY. Objectives and methods of teaching. The selection and organization of materials; the preparation of visual aids; the setting up of aquaria and other projects. The use of the field trip as a tool in teaching high-school biology. Mr. Schaefer. Prereq.: Two years of biological science and Educ. 58 with a grade of C or better. 2 rec.; 1 lab.; or field trip; 3 cr.

EDUCATION-BIOLOGY (ED-BIOL.) 93, 94. SUPERVISED TEACHING IN HIGH-SCHOOL BIOLOGY. (See description under Education.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

BOTANY

ALBION R. HODGDON, *Professor*; M. C. RICHARDS, *Professor*; AVERY E. RICH, *Professor*; JOHN F. REED, *Professor*; STUART DUNN, *Professor*; CHARLOTTE G. NAST, *Associate Professor*; MARION E. MILLS, *Assistant Professor Emerita*; RICHARD SCHREIBER, *Assistant Professor*

1. **GENERAL BOTANY.** An introduction to plant science. The evolution of structure and function in the plant kingdom. Not open to students who have had Biol. 1-2. Mr. Schreiber. 2 lec.; 2 lab.; 4 cr.

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3. **THE PLANT WORLD.** The structure and function of plant parts. The application of basic biological principles to plant life. Students who have had Bot. 1 should not elect this course. Miss Nast. Prereq.: Biol. 1-2. 2 lec.; 2 lab.; 4 cr.

6. **SYSTEMATIC BOTANY.** The identification and classification of our native trees, shrubs and wild flowers. Mr. Hodgdon. Prereq.: Biol. 1-2 or Bot. 1. 1 lec.; 2 lab.; 3 cr.

42. **PLANT ECOLOGY.** Plant life and its environment, including a consideration of the principal environment factors, such as light, temperature, soil, water, and biotic relations; study of associations, successions, and plant forms; a survey of plant distribution and underlying causes. Mr. Hodgdon. Prereq.: Bot. 1 or Bot. 3. 3 cr.

51. **PLANT PATHOLOGY.** The nature of disease in plants, the etiology, symptomatology, and classification of plant diseases. Mr. Rich. Prereq.: Bot. 1 or Bot. 3. 1 lec.; 2 lab.; 3 cr.

52. **PRINCIPLES OF PLANT DISEASE CONTROL.** Exclusion, eradication, protection, and immunization, and the specific, practical methods used to control plant diseases. Mr. Rich. Prereq.: Bot. 51. 1 lec.; 2 lab.; 3 cr. (Alternate years; offered in 1961-62.)

53. **PLANT ANATOMY.** The anatomy of vascular plants with special emphasis upon tissue development and structure. Miss Nast. Prereq.: Bot. 1 or Bot. 3. 1 lec.; 2 lab.; 3 cr.

54. **CYTOLOGY.** The structure, physiological behavior, and development of cells. The cellular basis of heredity. Mr. Schreiber. 3 lec.; 3 cr.

55. **ADVANCED SYSTEMATIC BOTANY.** The principles and laws of plant classification and nomenclature: study of plant families, field and herbarium work. Mr. Hodgdon. Prereq.: Bot. 6. Hours to be arranged. 4 cr.

56. **PLANT PHYSIOLOGY.** Structure and properties of cells, tissues, and organs; absorption and movement of water; metabolism; growth and irritability. Mr. Dunn. Prereq.: Bot. 1 or Bot. 3, and one year of chemistry. 2 lec.; 2 lab.; 4 cr.

57, 58. **INVESTIGATIONS IN (a) SYSTEMATIC BOTANY, (b) PLANT PHYSIOLOGY, (c) PLANT PATHOLOGY, (d) PLANT ANATOMY, AND MORPHOLOGY, (e) PLANT ECOLOGY, (f) AQUATIC PLANTS, and (g) CYTOLOGY.** Elective only upon consultation with Chairman of Department. Mr. Hodgdon, Mr. Dunn, Mr. Rich, Miss Nast, Mr. Reed, and Mr. Schreiber. Hours to be arranged. 2 to 6 credits.

59, 60. **BOTANY SEMINAR.** Library and reference work and the preparation of papers and abstracts on special phases of botany. Practice in the preparation of oral and written reports. Botany staff. Prereq.: Six hours of botany or permission of the Chairman of the Department. This course may be repeated for credit. 1 rec.; 1 cr.

62. **MORPHOLOGY OF THE VASCULAR PLANTS.** The life histories of the Pteridophytes, Gymnosperms, and Angiosperms, including comparisons of general structure and sexual organs. Miss Nast. Prereq.: Bot. 1 or Bot. 3. 2 lec.; 2 lab.; 4 cr. (Alternate years; not offered 1961-62.)

64. **MICROTECHNIQUE.** A methods course in embedding, sectioning, and staining plant tissues, and introduction to photomicrography. Miss Nast. Prereq.: Bot. 1 or Bot. 3. 3 cr. (Alternate years; offered in 1961-62.)

68. **MYCOLOGY.** Studies of the parasitic and saprophytic fungi, their growth, reproduction, and identification. Mr. Richards. 1 lec.; 2 lab.; 3 cr.

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BUSINESS ADMINISTRATION

(See *Economics and Business Administration*)

CHEMICAL ENGINEERING

OSWALD T. ZIMMERMAN, *Professor*; IRVIN LAVINE, *Professor*

51. **CHEMICAL ENGINEERING PRINCIPLES I.** Units and dimensional analysis; material and energy balances; gaseous, solid, and liquid fuels; combustion; introduction to fluid flow and heat transfer. Laboratory work includes experiments in the use of various types of temperature measuring devices and flow meters; gas analysis; calorimetry; and heat transfer. Mr. Lavine. 3 lec. or rec.; 1 lab.; 4 cr.

52. **CHEMICAL ENGINEERING PRINCIPLES II.** A number of selected processes treated from the points of view of thermodynamics, kinetics, catalysis, instrumentation, materials handling, and materials of construction; and an introduction to costs. Processes include petroleum refining, ammonia synthesis, chlorine-caustic production, and the manufacture of sulfuric, nitric, and hydrochloric acids, and soda ash. Laboratory experiments in the use of various types of apparatus for measuring the viscosity and other properties of petroleum products; measurements of the rates of chemical reactions; and experiments in size reduction and separation, and fluidization. Mr. Lavine. 3 lec. or rec.; 1 lab.; 4 cr.

54. **CHEMICAL ENGINEERING PRINCIPLES III.** The theories and applications of fluid mechanics, heat transfer, evaporation, crystallization, filtration, humidity and air conditioning, and drying. 3 lec. or rec.; 3 cr.

63. **CHEMICAL ENGINEERING PRINCIPLES IV.** The theories and applications of the chemical engineering diffusional operations. Mass transfer, simultaneous mass and heat transfer, gas and liquid diffusion, gas absorption, distillation, liquid-liquid extraction, and solid-liquid extraction. 3 lec. or rec.; 3 cr.

65. **CHEMICAL ENGINEERING LABORATORY.** A laboratory study, using typical chemical engineering equipment, of fluid flow, heat transfer, evaporation, distillation, humidification, drying, filtration, gas absorption, liquid-liquid extraction, and solid-liquid extraction. Mr. Lavine. 2 lab.; 2 cr.

66. **CHEMICAL ENGINEERING ECONOMICS AND PLANT DESIGN.** The principles of cost engineering, including estimation of plant investment, working capital, operating costs, labor requirements, payout time, and profitability. Value of money, capitalized costs, simple and compound interest, depreciation, taxes and insurance, labor requirements, overhead, financing of chemical enterprises, design of equipment and plants for minimum cost, plant location, transportation, sales cost, equipment cost, and cost indexes. Each class selects one or more problems involving the complete design of a chemical plant. For each problem, the most desirable process must be determined, the site selected, the equipment and plant designed, calculations made for all costs, profitability and payout time, and a complete report prepared, including the drawings of equipment and plant layout. Mr. Lavine. 1 lec. or rec.; 3 lab.; 4 cr.

67. **CHEMICAL ENGINEERING THERMODYNAMICS.** The fundamental laws of energy and their application to chemical engineering problems. Mr. Zimmerman. 3 lec. or rec.; 3 cr.

DESCRIPTION OF COURSES

68. **PHYSICAL METALLURGY.** An introductory study of the nature of metals, emphasizing the quantum mechanical description of the solid state and including atomic structure, bonding, historical development of metal theories, elementary zone or band theory, and X-ray diffraction. The microscopic metal system is also considered, and thermodynamics of metallurgical processes, defects and dislocations, phase relations of pure metals and alloys, microstructure, and physical and thermal treatment of metals are discussed. 2 lec. or rec.; 1 lab.; 3 cr.

69. **CHEMICAL ENGINEERING PROJECT.** Each student selects a research problem which he carries out independently under faculty supervision. Intensive study in both the library and the laboratory and a satisfactory report upon completion of the work are required. Mr. Zimmerman. 3 lab.; 3 cr.

81. **PROGRESS DYNAMICS.** Study of responses of physical systems and feedback principles, and their application to design and analysis of process control systems. Mr. Zimmerman. 3 lec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

CHEMISTRY

HAROLD A. IDDLER, *Professor*; ALBERT F. DAGGETT, *Professor*; JAMES A. FUNKHOUSER, *Professor*; HELMUT M. HAENDLER, *Professor*; HENRY G. KUIVILA, *Professor*; ROBERT E. LYLE, JR., *Professor*; CHARLES M. WHEELER, JR., *Associate Professor*; ALEXANDER R. AMELL, *Associate Professor*; PAUL R. JONES, *Assistant Professor*; ALBERT K. SAWYER, *Assistant Professor*; FRANK L. PILAR, *Assistant Professor*; GLORIA G. LYLE, *Assistant Professor*; KENNETH K. ANDERSEN, *Assistant Professor*; ROBERT W. RICCI, *Instructor*

1-2. **GENERAL CHEMISTRY.** Elementary chemistry with lecture demonstrations and laboratory practice. Topics of interest to the professional student and of general interest are presented. For Agriculture and Home Economics students and as an elective. Mr. Sawyer and assistants. 3 lec.; 1 lab.; 4 cr.

3-4. **GENERAL CHEMISTRY.** The fundamental laws and conceptions of chemistry, including a study of the nonmetals and metals and their compounds. The theoretical principles are illustrated by lecture demonstrations, and the applications of chemistry in the professions are explained. Mr. Funkhouser, Mr. Sawyer, Mr. Haendler, Mr. Wheeler, Mr. Andersen, Mr. Hatch, and assistants. For students who plan to take further courses in the Department of Chemistry. 2 lec.; 1 rec.; 1 lab.; 4 cr.

5-6. **INORGANIC CHEMISTRY.** General inorganic chemistry, including qualitative analysis. The preparation of secondary school chemistry will furnish a basis for a thorough course for Chemistry majors and others who may elect the course. Mr. Iddles and assistants. 3 lec.; 1 rec.; 2 lab.; 6 cr.

17. **QUANTITATIVE ANALYSIS.** An elementary course in quantitative analysis designed for those students desiring a brief terminal course in analytical chemistry. Mr. Daggett and assistants. Prereq.: Chem. 4. 2 lec.; 2 lab.; 4 cr.

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21. (21). SEMIMICRO QUALITATIVE ANALYSIS. The fundamental theories of solutions as applied to the reactions of qualitative analysis. Problem work is required. The laboratory work uses the semimicro technique and provides ample experience in the analysis of simple and complex mixtures. Mr. Crowley and assistants. Prereq.: Chem. 4. 2 lec.; 2 lab.; 4 cr.

22. QUANTITATIVE ANALYSIS. The theory and laboratory technique of the more common determinations of gravimetric and volumetric analysis. Emphasis on the solution of problems. A comprehensive study of the more common analytical methods. Mr. Daggett and assistants. Prereq.: Chem. 21. 2 lec.; 3 lab.; 5 cr.

45. (45). ORGANIC CHEMISTRY. An introductory but comprehensive study of the chemistry of carbon compounds with emphasis on the particular phases of the subject needed by students preparing to be technicians, nurses, majors in biological sciences, and others, where a brief course is desired. Mrs. Lyle. Prereq.: Chem. 3-4. (Elective for Medical Technology, Nursing, and Pre-Dental students, and majors in Botany.) 3 lec.; 2 lab.; 5 cr.

47-48. ORGANIC CHEMISTRY. The principal classes of organic compounds, aliphatic and aromatic, with emphasis on class reactions and structural theory. Laboratory exercises in the preparation and purification of selected organic compounds; also the use of group reactions for the identification of organic substances in a systematic scheme of qualitative organic analysis. Mr. Jones, Mr. Andersen, and assistants. Prereq.: Qualitative Analysis. 3 lec.; 2 lab.; 5 cr.

51-52. ORGANIC CHEMISTRY. The principal classes of organic compounds, aliphatic and aromatic, with emphasis on class reactions and structural theory. Laboratory exercises in the preparation and purification of selected organic compounds. Mr. Funkhouser and assistants. Prereq.: junior standing; Chem. 21. 3 lec.; 2 lab.; 5 cr.

55-56. STRUCTURAL AND THEORETICAL PROBLEMS OF MODERN ORGANIC CHEMISTRY. The methods of preparation and reactions of the principal classes of organic compounds. The electron theory of organic chemistry is used to correlate these reactions. The variation in reactivity of these various classes of organic compounds is utilized as a method of characterization of organic compounds. Emphasis is on the solution of assigned problems. Mr. Lyle. Prereq.: One year of Organic Chemistry. 3 lec. for Chem. 55; 1 lec. and 2 labs. for Chem. 56; 3 cr.

61-62. ANALYTICAL CHEMISTRY. The theory and laboratory technique necessary for quantitative analysis. A thorough background of the fundamental procedures is followed by the use of the newer procedures and instrumental techniques. The lecture work stresses problem solution. Instruments used include the spectrograph, spectrophotometer, polarograph, electrometric titrimeters, colorimeters. Mr. Daggett. Prereq.: Chem. 5, 6. 3 lec.; 2 lab.; 5 cr.

63. INTRODUCTORY RADIOCHEMICAL TECHNIQUES. Radio chemical techniques and laboratory practice in the use of apparatus in many fields of science which utilize radio-chemical operations. Mr. Amell. Prereq.: General Inorganic Chemistry and General Physics. 3 lec.; 2 lab.; 5 cr.

82. INTRODUCTORY PHYSICAL CHEMISTRY. Kinetic theory of gases; quantitative laws for behavior of matter in the gas, liquid, and solid phases; valence and the chemical bond; radioactivity; atomic structure and

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valence; laws of solutions; homogenous and heterogenous equilibrium; colloids, electrochemistry. Designed for Pre-medical and Biology students. Mr. Ricci. Prereq.: Chem. 17-21, Phys. 2, Elementary Mathematics. 3 lec.; 1 lab.; 4 cr.

83-84. **ELEMENTARY PHYSICAL CHEMISTRY.** The properties of gases, liquids, and solids; thermochemistry and thermodynamics; solutions, chemical equilibria, reaction rates, conductance, and electromotive force. Mr. Pilar. Prereq.: Analytical Chemistry, Math. 10 or 23, and Physics. 3 lec.; 2 lab.; 5 cr.

85. **INORGANIC CHEMISTRY.** The relationship between chemical reactions and modern concepts of inorganic chemistry on a moderate level. The applicability and limitations of the newer ideas. Mr. Haendler. Prereq.: Chem. 83-84, or permission. 3 lec.; 3 cr.

86. **ADVANCED PHYSICAL CHEMISTRY.** A review of selected topics in elementary physical chemistry. Mr. Amell. Prereq.: One year of Physical Chemistry. 3 lec.; 3 cr.

87, 88. **CHEMICAL LITERATURE AND SEMINAR.** Use of the Chemical Library; student reports on topics of interest. Mr. Lyle and Mr. Kuivila. Prereq.: Chem. 48 or 52 and 84. 1 lec.; 1 cr.

89-90. **THESIS.** The related background and experimental observation of the year's investigation in some selected subject is required. Members of the staff. For seniors in Chemistry who have completed Chem. 48, 62, 84, and have a good point average. 5 lab.; 6 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

CIVIL ENGINEERING

J. HAROLD ZOLLER, *Professor*; EDMOND W. BOWLER, *Professor*; RUSSELL R. SKELTON, *Professor*; CHARLES O. DAWSON, *Professor*; EDWIN S. ALLING, *Associate Professor*; HAROLD E. LANGLEY, JR., *Associate Professor*; ARTHUR R. NICHOLSON, JR., *Instructor*

1. **SURVEYING.** Engineering measurements, using tape, transit, level, and stadia, and the computation, adjustment, and plotting of such measurements. Mr. Nicholson. Prereq.: Math. 21. 1 lec.; 2 lab.; 3 cr.

2. **ADVANCED SURVEYING.** Applications of engineering measurement theory; orientation by solar and Polaris observations; theory and use of the plane table; introduction to photogrammetry, simple curves, and earthwork computations. Mr. Nicholson. Prereq.: C. E. 1. 1 lec.; 2 lab.; 3 cr.

7. (7). **ELEMENTARY SURVEYING.** A course for non-civil engineering students in the theory and use of tape, level, transit, plane table, and stadia in making plane and topographic surveys. Computations and drafting exercises necessary for making surveys and maps for all purposes. Mr. Dawson and Mr. Nicholson. 2 lec.; 1 lab.; 3 cr.

17. **ENGINEERING MATERIALS.** Methods of manufacture, physical properties and the application of the various materials used in civil engineering works, including timber, steel, stone, brick, cement, concrete, and bituminous materials. Laboratory tests and reports on the testing of cements,

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aggregates, concrete specimens, cast iron, structural steel, wood, and other engineering materials. Mr. Skelton. Prereq.: M. E. 35 concurrently or as a prerequisite. 2 lec.; 1 lab.; 3 cr.

25. **THEORY OF DETERMINATE STRUCTURES.** The stress analysis of structures under fixed and moving loads. Roof trusses, highway and railroad bridges; use of influence lines, lateral bracing, and portals. Mr. Alling and Mr. Zoller. Prereq.: M. E. 35 as a prerequisite or concurrently. 3 lec.; 1 design period; 4 cr.

49, (49). **UNDERGRADUATE THESIS.** A limited number of qualified senior students will be permitted to pursue independent investigations under faculty guidance and write terminal theses reporting the results of their investigations. The thesis shall be typewritten and must be approved by the instructor under whom the work has been done. An approved copy of the thesis must be submitted to the department for retention. Prereq.: Permission of the instructor and senior standing. 2 to 4 cr.

50. **TRANSPORTATION ENGINEERING.** The development, organization, administration, and inter-relation of transportation systems and facilities, including railroads, highways, airports, waterways, and pipe lines. Major emphasis will be given to the economics of location, geometric and structural design, construction materials, methods and costs, as applied to modern transportation engineering. Mr. Skelton. Prereq.: C.E. 2. 3 lec.; 3 cr.

51. **HIGHWAY ENGINEERING.** The economics of location, planning, and design of highways and city streets; methods of construction, maintenance, and specifications governing the various types of surfaces. The administration and methods of financing highway systems. Selected problems of planning and design are studied in the laboratory. Mr. Skelton. Prereq.: C. E. 6 and C. E. 17. 3 lec.; 1 lab.; 4 cr. (Will not be offered after 1961-62.)

52. **FLUID MECHANICS.** Properties of fluids; fluid statics; flow of incompressible and compressible ideal fluids; flow of real fluids; and measurement of fluid properties. Mr. Dawson and Mr. Zoller. Prereq.: M. E. 35 and Math. 23. 3 lec.; 3 cr.

53, (53). **FLUID MECHANICS LAB.** Experimental study of fluid properties and their relation to the solution of practical problems. Mr. Dawson. Prereq.: C. E. 52 as a prerequisite or concurrently. 1 lab.; 1 cr.

54. **SOIL MECHANICS.** Soil classification, physical properties including permeability, compressibility, bearing capacity, settlement and sheer resistance are related to the principles underlying the behavior of soils subjected to various loading conditions. Underground exploration and typical foundation problems are included. Mr. Skelton. Prereq.: C. E. 51 and 59, or permission of the instructor. 3 lec.; 1 lab.; 4 cr. (To be offered in Semester I after 1961-62.)

56. **STEEL DESIGN.** The design of members and connections; tension and compression members, beams, plate girders; riveted, bolted, and welded joints. Mr. Alling. Prereq.: C. E. 17 and 25. 2 lec.; 1 design period; 3 cr.

57. **THEORY OF INDETERMINATE STRUCTURES.** Beam and truss deflections. The analysis of continuous beams and rigid forms by classical and modern methods; indeterminate trusses. Mr. Alling. Prereq.: C. E. 56. 3 lec.; 1 design period; 4 cr.

59. **REINFORCED CONCRETE DESIGN.** The principles of reinforced concrete, including rectangular beams, slabs, T-beams, columns, footings, retaining

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walls. Mr. Alling. Prereq.: C. E. 57 as a prerequisite or concurrently. 2 lec.; 1 design period; 3 cr.

60. **STRUCTURAL ENGINEERING.** The planning and design of determinate and indeterminate structures. Introduction to modern design theories; prestressed concrete, plastic theory of steel and reinforced concrete. Mr. Alling. Prereq.: C. E. 57 and C. E. 59. 2 lec.; 1 design period; 3 cr.

63. **WATER SUPPLY AND TREATMENT.** The sources, quantity, quality, and sanitary aspects of public water supplies. Methods of purification and distribution systems. Prereq.; C. E. 52. 3 lec.; 3 cr.

64. **SEWERAGE AND SEWAGE TREATMENT.** The theory and problems of sewerage, the principles governing the disposal of sewage, and the various methods of sewage treatment. Prereq.: C. E. 63. 3 lec.; 1 lab.; 4 cr.

65. **HYDRAULIC ENGINEERING.** Application of fluid mechanics to hydraulics problems, such as reservoirs, dams, control works, open-channel flow, hydroelectric power, irrigation, drainage, and multipurpose projects. Prereq.: C. E. 52. 2 lec.; 1 lab.; 3 cr.

66. **HYDROLOGY.** The occurrence and physical effects of water on the earth, including meteorology, groundwater, runoff, and steam/flow routing. Prereq.: C. E. 52 concurrently or as a prerequisite. 2 lec.; 1 lab.; 3 cr.

67. **HIGHWAY ENGINEERING I.** Highway organization, administration, finance, planning, programming, traffic surveys, traffic methods; highway laws, contracts, specifications; highway capacity, geometric design, access control, safety, accident studies; pavement selection, performance, and maintenance. Mr. Skelton. Prereq.: C. E. 50. 3 lec.; 3 cr. (Not offered until 1962-63.)

68. **HIGHWAY ENGINEERING II.** Design of flexible and rigid pavements and bases for highways, airports, and city streets; pavement selection, construction methods, materials, specifications, and engineering cost estimates. Mr. Skelton. Prereq.: C. E. 50. 3 lec.; 1 lab.; 4 cr. (Not offered until 1962-63.)

71. **COMMUNITY PLANNING.** An introduction to community planning. Social, economic, and physical factors affecting community planning; content and extent of desirable community planning programs, including purpose and scope, the preliminary survey, elements of community land planning, the master plan, transportation systems, street patterns and traffic, motor vehicle parking, airport sites, public building sites, parks and recreational facilities, zoning, control of land subdivision, neighborhood centers, housing, legal, financial and economic problems, and redevelopment of blighted areas. Mr. Dawson. Prereq.: Permission of the instructor. 3 lec.; 3 cr.

74. **TIMBER DESIGN.** Properties and characteristics of structural woods, mechanics of wood, connection methods, design of timber members and connections in beams, columns, and trusses, and glued laminates of wood. Mr. Alling. Prereq.: C. E. 25 and C. E. 56 and permission of the instructor. 1 lec.; 1 design period; 2 cr.

77. **CONTRACTS, SPECIFICATIONS, AND PROFESSIONAL RELATIONS.** The essential elements required in engineering contracts; the purposes and content of specifications; professional conduct, relations, and ethics; and estimating by means of quantity surveys and unit cost methods. Mr. Dawson. Prereq.: Permission of the instructor. 3 lec.; 3 cr.

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78. **STRUCTURAL MEMBERS.** Selected problems in the analysis and design of structural members; such as beams on elastic foundations, curved beams, beam columns, buckling, torsion. Mr. Alling. Prereq.: C. E. 56 and permission of the instructor. 3 lec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

DAIRY SCIENCE

KENNETH S. MORROW, *Professor*; HARRY A. KEENER, *Professor*; NICHOLAS F. COLOVOS, *Associate Professor*; HERBERT C. MOORE, *Associate Professor*

5. **FUNDAMENTAL OF DAIRYING.** A general survey of the dairy industry; the selection, feeding, and management of dairy cattle; the composition and properties of milk and other dairy products; dairy manufacturing processes; market milk. Mr. Morrow and Mr. Moore. 2 lec.; 1 lab.; 3 cr.

30. **DAIRY BACTERIOLOGY.** The application of bacteriology principles to the production and processing of milk and other dairy products. Mr. Moore. 2 lec.; 2 lab.; 4 cr.

33. **DAIRY PRODUCTS JUDGING.** The various standards and grades of dairy products, with practice in judging milk, butter, cheese, and ice cream. Mr. Moore. 1 lab.; 1 cr.

34. **DAIRY CATTLE JUDGING.** Comparative judging of dairy cattle using animals in the University herd and in nearby herds. Mr. Morrow. 1 lab.; 1 cr.

36. **ADVANCED DAIRY CATTLE JUDGING.** Continuation of Dairy Science 34. Emphasis on training for participating on dairy cattle judging teams. Mr. Morrow. Prereq.: Dy. Sci. 34. 1 lab.; 1 cr.

60. **DAIRY SEMINAR.** The literature covering recent research in the various phases of the dairy industry. Students are required to prepare and present oral and written reports on selected topics. Dairy Science staff. 2 lec.; 2 cr.

62. **ADVANCED DAIRY SCIENCE.** Basic data, fundamental observations, and discussions of research contributing to the present status of the dairy industry. Mr. Moore. Prereq.: Adequate preparation in chemistry and bacteriology. 2 lec.; 2 cr.

63. **DAIRY CATTLE.** Purebred dairy cattle, breed history, pedigrees; family lines and methods of outstanding breeders; the application of the principles of genetics to the improvement of dairy cattle herd analysis. Mr. Morrow. 2 lec.; 1 lab.; 3 cr.

64. **MILK PRODUCTION.** Feeding and management of dairy animals; calf feeding; raising young stock; feeding for economical milk production. Mr. Keener. 2 lec.; 1 lab.; 3 cr.

65. **MARKET MILK.** The producing, handling, and distribution of market and certified milk; dairy farm inspection; control of milk supply. Mr. Moore. 2 lec.; 1 lab.; 3 cr.

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66. ICE CREAM, BUTTER, AND CHEESE. The making, handling, and marketing of ice cream, butter, and cheese. Mr. Moore. 2 lec.; 1 lab.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

DRAMA

(See *Speech and Drama*)

THE WHITTEMORE SCHOOL OF ECONOMICS AND BUSINESS ADMINISTRATION

ARTHUR W. JOHNSON, *Professor*; CARROLL M. DEGLER, *Professor*; JOHN A. HOGAN, *Professor*; RUTH J. WOODRUFF, *Professor*; DORIS E. TYRELL, *Associate Professor*; SAM ROSEN, *Associate Professor*; MYRA L. DAVIS, *Assistant Professor*; JOHN A. BERGERON, *Assistant Professor*; RONALD D. MICHMAN, *Assistant Professor*; JOHN A. BASSETT, *Instructor*; RUSSELL W. JOHNSON, *Instructor*; JOSEPH E. MICHAEL, JR., *Part-time Instructor*

Business Administration

Note — Students who have completed two or more years of bookkeeping in preparatory school will be permitted to register for B.A. 3-4, *Intermediate Accounting*, upon passing, without academic credit, an examination covering material of B.A. 1-2.

Register for the following courses as B.A. 1, etc.

1-2. PRINCIPLES OF ACCOUNTING. The fundamentals of accounting. Theory of debit and credit; functions and classification of accounts; modern accounting records including special and columnar books. Adjusting entries, work sheets, and financial statements. Single proprietorship, partnerships, and introduction to corporations. Mr. Bassett and Mr. Russell Johnson. 3 lec. or rec.; 3 cr.

3-4. INTERMEDIATE ACCOUNTING. Corporation accounting principles and objectives of valuation, consignments, installment selling, depreciation and depletion, funds and reserves, application of funds, and analysis of financial statements. Mr. A. W. Johnson. Prereq.: B.A. 2. 3 lec. or rec.; 3 cr.

7-8. COST ACCOUNTING. The relation of cost accounting to general accounting. The place of cost accounting in modern business. Types of cost systems and their application to particular lines of business. Careful analysis of methods of computing costs. Principles of cost control. Mr. A. W. Johnson. Prereq.: B.A. 2. 3 lec. or rec.; 3 cr.

9-10. HOTEL ACCOUNTING. Current hotel and restaurant accounting and cost control systems. Includes a study of hotel financial reports and their interpretation. Mr. Russell Johnson. Prereq.: B.A. 1-2. 2 lec.; 1 lab.; 3 cr.

21-22. COMMERCIAL LAW. The law of contracts, agency, sales, negotiable instruments, partnerships, and corporations. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr.

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23, (23). BUSINESS COMMUNICATION. Report writing, including preparation of charts, forms and graphs; intra-office, inter-office, and inter-business communication; instruction data for employees, minutes of meetings, and manuals of company practices and procedures; business letters. Mr. Schultz. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

24. INTRODUCTION TO BUSINESS. An orientation toward the more advanced courses in business administration, or a one-semester terminal course for non-majors. The major fields and problems of business administration: production, distribution, finance, and control. Business in relation to the economy as a whole. *Open only to freshmen and sophomores.* 3 lec. or rec.; 3 cr.

34. BUSINESS MANAGEMENT. Principles and techniques of successful organization, management, and operation of business activities, including the qualifications, functions, and activities of the executive. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr.

45. PRINCIPLES OF SELLING. Principles and methods used by commercial and industrial concerns in selling to the ultimate consumer, middle man, and other businesses. Principles employed in personal selling in national sales organizations, manufacturers, producers, and in retail establishments. Mr. Michman. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr.

46. PRINCIPLES OF RETAILING. Methods and principles of operating chain, department, specialty, and unit stores. Retail location, store layout and merchandise classification, sales and service policies, pricing, buying, and organization. Mr. Michman. Prereq.: Econ. 25. 3 lec. or rec.; 3 cr.

47. PRINCIPLES OF ADVERTISING. Advertising as an element of marketing strategy for the firm. Management considerations involved in the selection of the appropriate form of advertising. Campaign planning, media selection, and effectiveness testing. Mr. Michman. Prereq.: Econ. 25. 3 lec. or rec.; 3 cr.

48. SALES MANAGEMENT. Principles of successful sales management, their application, merchandising, sales promotion, building a sales organization; advertising's place in sales management; sales policies, costs, and controls; selection, development, and training of sales staffs. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

52. MARKET ANALYSIS AND RESEARCH. The nature, procedures, and applications of market research; probability and non-probability sample design; significance test. Mr. Michman. Prereq.: Econ. 25. 3 lec. or rec.; 3 cr.

55. ADVANCED ACCOUNTING. Advanced theory of accounting, corporate consolidations, insolvencies, realization and liquidation problems, estate accounting. Mr. A. W. Johnson. Prereq.: B.A. 4 or equivalent. 3 lec. or rec.; 3 cr.

56. FEDERAL TAX ACCOUNTING. The federal income tax laws and accounting procedure in connection therewith: social security taxes, estate, and gift taxes. Mr. A. W. Johnson. Prereq.: B.A. 4, or permission of the instructor. 3 lec. or rec.; 3 cr.

57. AUDITING. Procedure and practice in the verification of records, analysis of accounts, and the presentation of conclusions. Responsibilities of the auditor and the procedure and practice of preparing reports. Mr. A. W. Johnson. Prereq.: B.A. 4 or equivalent. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

DESCRIPTION OF COURSES

61. **ANALYSIS OF FINANCIAL STATEMENTS.** Analysis and interpretation of accounting data as presented in corporate balance sheets and operating statements for the use of management in controlling its business. Comparative analysis, uses of both operating and financial statements. Mr. A. W. Johnson. Prereq.: B.A. 4 or equivalent or permission of instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered in 1961-62.)

68. **PERSONNEL ADMINISTRATION.** Methods, techniques, and psychology employed in personnel administration from the standpoint of the executive. The case study method is used. Mr. Hogan. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

70. **GENERAL INSURANCE.** The field of insurance; social value; physical and moral hazards; risk, its nature and economic significance; reinsurance; types of insurance coverage; fire, casualty, life, social; fidelity and surety bonds. Mr. A. W. Johnson. 3 lec. or rec.; 3 cr.

Secretarial Studies

Register for the following courses as Secl. 1, etc.

1-2. **SHORTHAND.** Principles of Gregg shorthand with practice in transcribing from shorthand plates and class notes. Secl. 7-8 must be taken in conjunction with this course or precede it. Miss Tyrrell. Prereq.: Permission of instructor. 5 rec.; 3 cr.

3-4. **ADVANCED SHORTHAND.** A review of fundamental principles, the building of shorthand vocabulary, practice in taking dictation at increasing rates of speed, and practice in developing skill and speed in transcription. 5 rec.; 3 cr.

5, (5). **PERSONAL USE TYPEWRITING.** Practice in acquiring correct typing techniques, arranging letters, outlines, notes, themes, bibliographies, and simple tabulations. Open to any student who does not know how to typewrite. Miss Davis. Prereq.: Permission of instructor. 5 lab.; 1 cr.

7-8. **TYPEWRITING.** Practice in acquiring correct typewriting techniques, and in arranging letters, tabulations, and simple manuscripts. Miss Davis. Prereq.: Permission of instructor. 5 lab.; 2 cr. (*See Secl. 27.*)

9-10. **ADVANCED TYPEWRITING.** Practice in tabulating and in writing business letters, legal papers, and various business forms. Miss Davis. Prereq.: Secl. 8 or the equivalent and permission of the instructor. 5 lab.; 2 cr.

11. **FILING.** Various alphabetic, numeric, geographic, and subject-matter systems of correspondence filing; cross reference; follow-up methods; filing supplies and equipment. Miss Davis. Prereq.: Secl. 7 and permission of instructor. 3 lec. or rec.; 2 cr.

(13). **OFFICE MACHINES.** Duplicating methods; practice in typing master copies and stencils, and in operating an electric typewriter, a mimeograph, a mimeoscope, and a liquid process duplicator; practice in machine transcription; and an introduction to adding and calculating machines. Miss Davis. Prereq.: Secl. 8 and permission of instructor. 5 lab.; 2 cr.

17-18. **SECRETARIAL OFFICE PROCEDURE AND PRACTICE.** First semester, discussion of secretarial duties and traits; problems in the discharge of various duties; and problems in office management. Second semester, 144 hours of practice secretarial work in business offices. Miss Tyrrell. This course must

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be taken in conjunction with Secl. 3-4 and Secl. 9-10, or following these courses and with permission of instructor. 3 rec.; 3 cr.

22. **ADVANCED DICTATION.** Speed building in dictation and transcription. Miss Tyrrell. Prereq.: Secl. 4 and permission of instructor. 3 rec.; 3 cr.

23-24. **BUSINESS WRITING.** Review of grammar, word usage, punctuation, and sentence construction. Practice in writing various types of business letters and reports; proofreading; editing. Prereq.: One semester of typewriting preceding this course or taken in conjunction with it. Miss Tyrrell. 3 lec. or rec.; 3 cr.

27. **TYPEWRITING.** Practice in acquiring typewriting techniques, and in arranging letters, tabulations, and simple manuscripts. This course, which begins on November 6, 1961, is to be taken instead of Secl. 7 by Secretarial students who have had Secl. 5 or the equivalent. Prereq.: Secl. 5 or equivalent and permission of instructor. Miss Davis. 5 lab.; 1 cr.

Economics

Register for the following courses as Econ. 1, etc.

1-2. **PRINCIPLES OF ECONOMICS.** The principles which explain the organization and operation of the economic system. Mr. Bergeron, Mr. Bassett, Mr. Degler, Mr. Hogan, Miss Woodruff, and Mr. Rosen. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

3, (3), **ECONOMIC AND COMMERCIAL DEVELOPMENT OF THE UNITED STATES.** Historical survey of American business and industry with emphasis on the period since 1860. Miss Woodruff. 3 lec. or rec.; 3 cr.

9. **TRANSPORTATION.** The economic significance of transportation; its influence on the location of economic activity. Development, organization, and regulation of transportation agencies. Mr. Michman. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

25. **MARKETING.** The distribution of goods in the United States. The marketing behavior of the firm and its consequences for the economy as a whole. Price competition, the nature and economic significance of non-price competition. The influence of technology on market structure. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

31, (31). **STATISTICS FOR ECONOMICS AND BUSINESS.** Methods of collection analysis and presentation of statistical data. Statistical technique as an aid in decision making in business and economics. Required of all students majoring in Economics and in the Business curricula. Mr. Bergeron. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

51. **LABOR ECONOMICS.** Historical background and present status of labor organizations and problems. Labor-management relations and collective bargaining; economics of wages and employment; case studies. Mr. Hogan. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

52. **PUBLIC FINANCE.** Problems and policies of expenditure, revenue and debt of federal, state, and local governments. Economic analysis and evaluation of individual types of taxes as well as entire government fiscal programs; critical appraisal of recommended changes in tax systems; tax problems in the State of New Hampshire. Mr. Rosen. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

DESCRIPTION OF COURSES

53. **MONEY AND BANKING.** The monetary and banking system with reference to monetary standards, value of money, commercial and non-commercial banking, and structure and policy of the Federal Reserve System. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

54. **ADVANCED MONEY AND BANKING.** Advanced monetary theory and some of the more practical aspects of modern banking. Mr. Degler. Prereq.: Econ. 53 and permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

55. **CORPORATIONS.** The forms of business organization with special emphasis on the corporate system, combination, and concentration. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

56. **CORPORATION FINANCE.** Corporate securities, methods of financing, and financial policy. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

58. **PRINCIPLES OF INVESTMENT.** The problems of investment, investment characteristics of stocks and bonds; public utility, railroad, industrial, and government securities; protection of the investor; investment banking; and related problems. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr. (Alternate years; offered in 1961-62.)

63. **INTERNATIONAL TRADE AND FINANCE.** Theory of international trade, foreign exchange, balance of international payments, tariffs and protection; the economic aspects of international relations, with particular reference to recent policies. Miss Woodruff. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

64. **COMPARATIVE STUDY OF ECONOMIC SYSTEMS.** An examination of socialism, communism, capitalism, and modification of these types, particularly as exemplified by leading nations. Miss Woodruff. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

66. **LABOR LAW.** Principles of labor law and legislation. Prereq.: Econ. 2 or Govt. 2. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

73. **VALUE AND DISTRIBUTION.** Analysis of supply and demand. The determination of prices, production, and the distribution of income in realistic non-competitive situations as well as in the purely competitive model. General equilibrium. Mr. Bergeron. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

75. **NATIONAL INCOME.** The measurement, theory, and public policy applications of national income. Mr. Rosen. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

76. **ECONOMIC FLUCTUATIONS (Business Cycles).** Recurrent movements of prosperity and depression, with emphasis upon causes and public policy applications. Mr. Rosen. Prereq.: Econ. 2 and one additional semester course in Economics or permission of the instructor. 3 lec. or rec.; 3 cr.

78. **HISTORY OF ECONOMIC THOUGHT.** Traces the evolution of economic science. Examination and critical appraisal of the work of major economists and major schools of economists, particularly with reference to the applicability of their theories to current problems and the extent to which their theories influence modern economics. Mr. Bergeron. Prereq.: Econ. 73. 3 lec. or rec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
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EDUCATION

EVERETT B. SACKETT, *Professor*; THOMAS O. MARSHALL, *Professor*; WAYNE S. KOCH, *Professor*; CARLETON P. MENGE, *Associate Professor*; PAUL R. LOHNES, *Assistant Professor*; EUGENE C. JORGENSEN, *Assistant Professor*

CARL LUNDHOLM, *Professor* (Physical Education); GEORGE R. THOMAS, *Professor* (Art-Education); PHILIP S. BARTON, *Professor* (Agricultural-Education); MARION C. BECKWITH, *Professor* (Physical Education); PAUL E. SCHAEFER, *Associate Professor* (Biology-Education); DORIS E. TYRRELL, *Associate Professor* (Secretarial Studies-Education); DAVID F. LONG, *Professor* (History-Education); E. WILLIAM OLSON, *Associate Professor* (Physical Education); LEWIS C. GOFFE, *Assistant Professor* (English-Education); ROBERT O. KIMBALL, *Assistant Professor* (Mathematics-Education); JOHN B. WHITLOCK, *Associate Professor* (Music-Education); CHARLES H. LEIGHTON, *Instructor* (Language-Education); DAVID APPLETON, JASON BOYNTON, ADELAIDE DODGE, ANNE MCWEENY, EDWARD K. ROUNDY, ALGER BOURNE, GEORGE W. PASICHUKE, IRIS VALLEY, *Consultants in Teacher Education*

SUPERVISING TEACHERS 1961-62

Leonard Armstrong, Marguerite Chamberlain, Dorothy Colpritt, Celia Curran, Paul DeGross, William Elwell, Kathryn Flanagan, Gwendolyn Flannigan, Felix Heins, Gene Hunter, Muriel Kendrick, Nancy Kendrick, Barbara Lamphere, Muriel Manson, Anthony Marandos, Anne McWeeney, Benjamin Mooney, Robert Moore, Mabel Noyes, Mary Reilly, Mary Riley, Marian Saunders, John Sibson, Janet Tibbets, Edmund Valade, John Waldron, Neal Wiggin.

Courses in Education

41, (41), EDUCATIONAL PSYCHOLOGY. An examination of behavior in infancy, childhood, and adolescence with emphasis on the developmental effects of home and school. This course is a prerequisite to Liberal Arts undergraduate teaching preparation programs. Mr. Menge and Mr. Lohnes. Not open to freshmen. 3 rec.; 3 cr.

57, (57), PRINCIPLES OF LEARNING. Psychology of learning as it operates within the classroom. Prereq.: Education 41, required tests for teachers selection, and permission of the department. Mr. Koch, Mr. Menge, and Mr. Lohnes. 3 rec.; 3 cr.

58, (58), PRINCIPLES OF TEACHING. This course is concerned with the theories of learning studied in Education 57, with specific emphasis upon the following: organization of content, specific planning, and a study of procedures essential to the evaluation of the learning processes. Prereq.: Education 57. Mr. Marshall, Mr. Lohnes, and Mr. Jorgenson. Two 2-hour rec.-labs.; 3 cr.

59, (59), PRINCIPLES OF EDUCATION. American schools have developed, and are still developing, in unique forms quite unlike their European counterparts. Among Americans, however, there are basic disagreements concerning the direction our schools should take. This course deals with these conflicts of philosophy, the problems of American education and research pertinent to these problems. Prereq.: Education 57, or permission of the instructor. Mr. Marshall and Mr. Koch. 3 rec.; 3 cr.

DESCRIPTION OF COURSES

62. **PROGRAMMED INSTRUCTION.** Examination of the advantages and limitations of programmed instruction and of its psychological foundation. The various types of teaching machines will be considered as will the results of experimentation with programmed instruction. The methods of developing programmed instruction material will be studied and practiced. Prereq.: For undergraduate credit - experience as a teacher and courses in Educational Psychology and Methods of Teaching. Mr. Sackett. 3 cr.

(63). **INSTRUCTIONAL MEDIA.** To help improve ability to communicate ideas through materials and equipment commonly available in a school audio-visual center. Educational films, bulletin board design, the role of language labs, educational television, programmed learning, and media research will receive particular attention. A laboratory period of one hour each week is required in addition to the regular class period. Mr. Bardwell. Prereq.: Principles of Learning or permission of instructor. 3 cr.

64. **UTILIZATION OF TESTING IN PUBLIC EDUCATION.** Strategies for discovering and employing predictive validities of standardized tests in public school work are studied and practiced. Mr. Lohnes. 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
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Courses in Problems in the Teaching of High-School Subjects

The following courses are devoted to a study of problems, objectives, selection and organization of subject matter, teaching and testing techniques, and classroom management in the teaching of the respective subjects. To be admitted to one of these courses the student must have completed, with a grade of at least C, Education 58* and, in addition, the courses in the subject and related subjects designated as prerequisite to the respective courses in this group. A student desiring to be considered for Supervised Teaching must complete with a grade of at least C one of these courses in the subject in which he hopes to do supervised teaching.

For details concerning prerequisites and nature of these courses, see descriptions given under respective subject matter departments.

AGRICULTURE-EDUCATION (Ag-Ed) 89, 90. METHODS OF TEACHING FARM MECHANICS IN VOCATIONAL AGRICULTURE. Mr. Gilman. 1 lab.; 1 cr.

AGRICULTURAL-EDUCATION (Ag-Ed) 91, 92. PROBLEMS IN THE TEACHING OF VOCATIONAL AGRICULTURE. Mr. Barton. Open only to juniors and seniors in Agricultural Teacher Preparation. 2 lec. and 1 lab.; 3 cr.

ART-EDUCATION (ART-Ed) 91. PROBLEMS OF TEACHING ART IN ELEMENTARY SCHOOLS. 3 cr. Mr. Thomas.

ART-EDUCATION (ART-Ed) (92). PROBLEMS OF TEACHING ART IN SECONDARY SCHOOLS. 3 cr. Mr. Thomas.

BIOLOGY-EDUCATION (BIOL-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL BIOLOGY. 3 cr. Mr. Schaefer.

ENGLISH-EDUCATION (ENGL-Ed) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL ENGLISH. 3 cr. Mr. Goffe.

* Except for Ag. Ed. 89, 90, 91, 92, H.E.-Ed. 91 and P.E.-Ed. 91.

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HISTORY-EDUCATION (HIST-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL HISTORY AND OTHER SOCIAL STUDIES. 3 cr. Mr. Long.

HOME ECONOMICS-EDUCATION (HE-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL HOME ECONOMICS. 3 cr.

LANGUAGES-EDUCATION (LANG-ED) 91. PROBLEMS IN THE TEACHING OF MODERN LANGUAGES IN THE HIGH-SCHOOL. 3 cr. Mr. Leighton.

MATHEMATICS-EDUCATION (MATH-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL MATHEMATICS. 3 cr. Mr. Kimball.

MUSIC-EDUCATION (MU-ED) 90. PROBLEMS IN THE TEACHING OF ELEMENTARY SCHOOL MUSIC. 3 cr. Mr. Whitlock.

MUSIC-EDUCATION (MU-ED) 93. PROBLEMS IN THE TEACHING OF SECONDARY SCHOOL MUSIC. 3 cr. Mr. Whitlock.

PHYSICAL EDUCATION-EDUCATION (PE-ED) 91. PROBLEMS IN THE TEACHING OF PHYSICAL EDUCATION FOR WOMEN. 3 cr. Miss Newman.

Courses in Supervised Teaching

This work is required in the Teacher Preparation program. It is open only to students whose applications are approved by the Chairman of the Department of Education* and the Coordinators of Student Teaching in the subject or subjects in which the applicant desires to do supervised teaching. *Applications should be filed in the office of the Department of Education on or before November 15 of the academic year in which the supervised teaching is to be done. No applications will be considered* unless the applicant has completed with a grade of at least C the following courses in Education: 41, 57, and 58, and with superior grades in at least 18 semester credits in the subject matter field in which he desires to teach under supervision. The applicant must also complete with a grade of at least C a course in the problems of teaching the subject in which he desires to do supervised teaching.*

Students may be enrolled for from 6 to 14 credits of work in Supervised Teaching usually in the second semester of the academic year. Students registered in the College of Liberal Arts may count no more than 9 semester credits in Supervised Teaching toward the fulfillment of the major requirements in Education.

EDUCATION-AGRICULTURE (ED-AG) 93. SUPERVISED TEACHING IN VOCATIONAL AGRICULTURE. Prereq.: Senior standing in Agricultural Education curriculum.

EDUCATION-ART (ED-ART) 94. SUPERVISED TEACHING IN ART. Prereq.: ART-Ed 92.

EDUCATION-BIOLOGY (ED-BIOL) 93, 94. SUPERVISED TEACHING IN HIGH-SCHOOL BIOLOGY. Prereq.: BIOL.-Ed 91.

EDUCATION-COMMERCE (ED-CS) 94. SUPERVISED TEACHING IN HIGH-SCHOOL COMMERCIAL SUBJECTS.

EDUCATION-ELEMENTARY (ED-EL) 94. SUPERVISED TEACHING IN THE ELEMENTARY SCHOOL.

EDUCATION-ENGLISH (ED-ENGL) 94. SUPERVISED TEACHING IN HIGH-SCHOOL ENGLISH. Prereq.: ENGL-Ed. 91.

* Except Ed Ag. 93 wherein the credits are 17 and in Ed.-H.E. 94 wherein they are 7.

DESCRIPTION OF COURSES

EDUCATION-GENERAL SCIENCE (ED-GS) 94. SUPERVISED TEACHING IN HIGH-SCHOOL GENERAL SCIENCE.

EDUCATION-HISTORY (ED-HIST) 94. SUPERVISED TEACHING IN HIGH-SCHOOL HISTORY AND OTHER SOCIAL STUDIES. Prereq.: HIST-Ed 91.

EDUCATION-HOME ECONOMICS (ED-HE) 94. SUPERVISED TEACHING IN HIGH-SCHOOL HOME ECONOMICS. Prereq.: HE-Ed TV.

EDUCATION-LANGUAGE (ED-LANG) 94. SUPERVISED TEACHING IN HIGH-SCHOOL MODERN FOREIGN LANGUAGE. Prereq.: LANG-Ed 91.

EDUCATION-LATIN (ED-LAT) 94. SUPERVISED TEACHING IN HIGH-SCHOOL LATIN. Prereq.: LANG-Ed 91.

EDUCATION-MATHEMATICS (ED-MATH) 94. SUPERVISED TEACHING IN HIGH-SCHOOL MATHEMATICS. Prereq.: MATH-Ed 91.

EDUCATION-MUSIC (ED-MU) 93, 94. SUPERVISED TEACHING IN ELEMENTARY AND SECONDARY SCHOOL MUSIC. Prereq.: MU-Ed 90, 93.

EDUCATION-PHYSICAL EDUCATION (ED-PE) (92), 92. DIRECTED TEACHING OF PHYSICAL EDUCATION FOR WOMEN. Prereq.: PE-Ed 91 or concurrently. 1 lec. or rec.; 2 5-hr. lab.; 6 cr.

EDUCATION-PHYSICAL EDUCATION (ED-PE) 93, (93). DIRECTED TEACHING IN PHYSICAL EDUCATION FOR MEN. Prereq.: ZOOL. 17-18; P. E. 23 and 61. The student must have completed the methods course in the sport which he is directing or take the course concurrently. 3 cr.

ELECTRICAL ENGINEERING

ALDEN L. WINN, *Professor*; WILLIAM B. NULSEN, *Professor*; ROBERT N. FAIMAN, *Professor*; LEON W. HITCHCOCK, *Professor Emeritus*; JOHN B. HRABA, *Professor*; FLETCHER A. BLANCHARD, *Associate Professor*; ALBERT D. FROST, *Associate Professor*; JOSEPH B. MURDOCH, *Associate Professor*; DONALD W. MELVIN, *Assistant Professor*; RONALD R. CLARK, *Assistant Professor*; ROMAN A. BRYKOZYNSKI, *Assistant Professor*; ROBERT W. GOODRICH, *Instructor*

1-2. ELECTRICAL ENGINEERING. The fundamental physical laws and concepts of electrical engineering and their application to circuits, electric and magnetic fields, instrumentation, and direct-current machinery. Prereq.: Math. 23 and Phys. 23 taken concurrently with E.E. 1. E.E. 1: 2 rec.; 1 lab. or conf.; 3 cr. E.E. 2: 3 rec.; 1 lab.; 4 cr.

3-4. APPLIED ELECTROMAGNETICS. Electric and magnetic circuits, vector diagrams, and equivalent circuits as applied to transformers, synchronous, and asynchronous machines. Prereq.: E.E. 2, Math. 22. Required of juniors in Electrical Engineering. 3 rec.; 3 cr.

5. CIRCUIT THEORY. Single phase and polyphase circuits, network theorems, and wave analysis. Prereq.: E.E. 2. Required of juniors in Electrical Engineering. 3 rec.; 3 cr.

9. PHYSICAL ELECTRONICS. Electron ballistics, conduction in gasses, vacuum, metals, and semiconductors; theory of emission; theory of operation, characteristic curves, and equivalent circuits for electron devices such as vacuum and gas tubes, solid state rectifiers, and transistors. Prereq.: E.E. 5 taken concurrently. Required of juniors in Electrical Engineering. 3 rec.; 3 cr.

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10. **ELECTRONIC CIRCUITS.** Theory of operation, analysis, and design of active circuits containing electron devices. Prereq.: E.E. 9. Required of juniors in Electrical Engineering. 3 rec.; 1 lab.; 4 cr.

15, 16, 17, 18. **STUDENT BRANCH AIEE-IRE.** A student-conducted organization, operated under the by-laws of the institutes, designed to introduce the student to professional society activities. Approximately 10 to 12 meetings are scheduled during the year, usually in the evenings. These meetings provide lectures by industrial representatives, inspection trips, and attendance at state and regional meetings. Each student is required to become a student member of either the AIEE or the IRE with annual dues of \$5.00 per year. Required of juniors and seniors in Electrical Engineering. No credits.

23, 24. **ELECTRICAL LABORATORY.** Experimental investigations in the principles of electrical engineering as applied to direct and alternating current machines. Laboratory procedures and presentation of engineering reports. Prereq.: E.E. 2. Required of juniors in Electrical Engineering. 1 lab.; 2 cr.

25, 26. **ELECTRICAL LABORATORY.** Experimental investigations in the principles of electrical engineering as applied to electrical engineering systems, devices and components. Formal reports are required. Prereq.: E.E. 4, E.E. 10. Required of seniors in Electrical Engineering. 1 lab.; 2 cr.

31. **CIRCUITS AND APPLIANCES.** Electric circuit theory, wiring, methods, efficiency, protection of circuits and equipment, national electric code, meters, motors, illumination, signal circuits, and telephones. Prereq.: Hotel Administration 26. 3 rec.; 1 lab.; 4 cr.

39. **ELECTRICAL ENGINEERING FUNDAMENTALS.** Electric and magnetic fields and circuits. Prereq.: Physics 23. Required of seniors in Chemical Engineering and juniors in Civil and Mechanical Engineering. 3 rec.; 1 lab.; 4 cr.

40. **ELECTRONIC FUNDAMENTALS.** Physical electronics, electronic circuits with emphasis on instrumentation. Prereq.: E.E. 39. Required of juniors in Mechanical Engineering. 3 rec.; 1 lab.; 4 cr.

41. **ELECTRICAL MACHINERY AND CONTROLS.** Application of the fundamentals of electrical engineering to machines and systems. Prereq.: E.E. 39. Required of seniors in Mechanical Engineering. 2 rec.; 1 lab.; 3 cr.

45. **TRANSMISSION LINES AND NETWORK.** Transmission line fundamentals, T and Pi sections, filters, and symmetrical components. Prereq.: E.E. 5. Required of seniors in Electrical Engineering. 3 rec.; 3 cr.

46. **ELECTRIC FIELDS.** Static electric and magnetic fields, electromagnetic fields, Maxwell's equations, wave equations, plane waves. Prereq.: E.E. 2, Math. 24. Required of seniors in Electrical Engineering. 3 rec.; 3 cr.

52. **INDUSTRIAL ELECTRONICS FUNDAMENTALS.** Application of electronics to industrial processes. Prereq.: E.E. 46. Limited to students not registered in the Electrical Engineering curriculum. 2 rec.; 1 lab.; 3 cr.

58. **ELECTRONIC SYSTEMS ANALYSIS AND DESIGN.** Advanced techniques in network and systems analysis; use of complex frequency and signal flow graphs; coding, transfer, and storage of information. Prereq.: Permission of instructor. 3 rec.; 3 cr.

60. **ADVANCED CIRCUIT THEORY.** Steady state and transient analysis, derivation of fundamental formulas and constants; application of Laplace transforms. Prereq.: Permission of instructor. 3 rec.; 1 conf.; 4 cr.; when offered without conference period, 3 cr.

DESCRIPTION OF COURSES

62. **ILLUMINATION.** Radiation, fundamental processes in gases, atomic spectra, sources of visible and near visible energy, lamp circuitry, lighting and wiring design, control of light, photometry, and color. Prereq.: Permission of the instructor. 3 rec.; 3 cr.

70, (70). **ELECTRICAL ENGINEERING PROJECTS.** A laboratory or advanced study course. Each student will either join one of the department research projects or engage in a project which is in one of the following areas of current staff interest: Acoustics and Electronic Systems (Mr. Frost), Control Systems (Mr. Blanchard, Mr. Clark), Illumination (Mr. Murdoch), Magnetic Amplifiers (Mr. Melvin), Non-linear Analysis (Mr. Hraba), Semi-conductors (Mr. Winn), and Transient Analysis (Mr. Nulsen). Admission to the course will be limited to those accepted by a staff member. 1-4 conf. or 1-2 lab.; 1-4 cr.

78. **INDUSTRIAL ELECTRONICS.** Analysis and design of equipment for the measurement, instrumentation, and control of industrial processes; introductory theory of closed loop systems. Prereq.: Permission of the instructor. 3 rec.; 1 lab.; 4 cr.

80, (80). **ENGINEERING ANALYSIS.** The basic principles and analytical methods employed in the solution of complex problems in the various branches of engineering. Prereq.: Permission of the instructor. 3 rec.; 3 cr.

82. **CONTROL SYSTEMS.** Fundamental principles involved in the design and analysis of feedback control systems. Prereq.: Permission of the instructor. 3 rec.; 3 cr.; or 3 rec. and 1 lab.; 4 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
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ENGLISH

SYLVESTER H. BINGHAM, *Professor*; WILLIAM G. HENNESSY, *Professor*; CARROLL S. TOWLE, *Professor*; ROBERT G. WEBSTER, *Professor*; J. HOWARD SCHULTZ, *Professor*; LUCINDA P. SMITH, *Associate Professor Emerita*; G. HARRIS DAGGETT, *Associate Professor*; MAX S. MAYNARD, *Associate Professor*; DALE S. UNDERWOOD, *Associate Professor*; JOHN C. RICHARDSON, *Associate Professor*; LEWIS C. GOFFE, *Assistant Professor*; EDMUND G. MILLER, *Assistant Professor*; PHILIP L. NICOLOFF, *Assistant Professor*; JOSEPH P. McELROY, *Instructor*; S. ANTHONY CALDWELL, *Instructor*; NICHOLAS P. NICHOLS, *Instructor*; ERLAND E. JACOBSEN, *Instructor*; THOMAS A. WILLIAMS, Jr., *Instructor*; JOHN A. TAYLOR, *Instructor*; LEE S. BAIER, *Instructor*; HARRY G. MARTENS, *Instructor*

*A. **IMPROVEMENT IN WRITING.** Required of all students whose attainments in the *fundamentals of English* are found to be unsatisfactory. Assignment to classes from which the students may be excused either at the end of the semester or at the end of the year. 3 rec.; no credit.

*C. **IMPROVEMENT IN READING.** Intensive drill in reading skills for six weeks. 3 rec.; no credit.

* Any student may be recalled and reassigned to an instruction group at any time in his four years at college upon report of any member of the Faculty that his work in composition or in reading is deficient.

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1-2, (2), (1). FRESHMAN ENGLISH. Training to write more correctly and with more force and to read with more appreciation and discernment the chief types of literature. The staff of the department under the chairmanship of Mr. Miller. 3 rec.; 3 cr.

12. THE BIBLE AS LITERATURE. The various literary types found in the Bible and a survey of the influence of the Bible on English literature. Mr. Schultz. Prereq.: Engl. 1-2. 3 rec.; 3 cr. (Alternate years; offered 1961-62.)

13, 14. AN INTRODUCTION TO ENGLISH LITERATURE. The development of English literature from its beginning to the 20th century by means of selected readings. Mr. Richardson, Mr. Miller, and Mr. McElroy. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

15, 16. A SURVEY OF AMERICAN LITERATURE. Mr. Webster, Mr. Daggett, Mr. Goffe, and Mr. Nicoloff. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

23, (23). WRITING OF TECHNICAL REPORTS. Mr. Webster, Mr. McElroy, and Mr. Caldwell. Required of seniors in Agriculture and in Mechanical, Electrical, and Civil Engineering. 1 rec.; 1 lec.; 2 cr.

25-26. ADVANCED COMPOSITION. Practice with compositions of varying lengths. Class discussions with illustrative readings. Weekly conferences. Mr. Towle and Mr. Williams. Prereq.: Engl. 1-2. 3 lec. or rec.; 3 cr.

27. ENGLISH GRAMMAR. Mr. Goffe. Prereq.: Engl. 1-2. Limited to students in the Teacher Preparation Program. 3 rec.; 3 cr.

43, 44, 45. READING FOR THOUGHT. Analysis of three forms of writing: 43, Exposition; 44, Fiction; and 45, Poetry. Mr. Bingham and Mr. Richardson. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

53, 54. WRITING AS AN ART. The study and practice of forms of writing, together with an examination of the history of literary philosophy. Practice in mutual criticism through class workshop discussions and written comment. Freedom in selection and pursuance of writing interests. Individual conferences. Mr. Towle. Prereq.: Engl. 25 or its equivalent. 2 lec.; 1 rec.; 3 cr. (Alternate years; not offered 1961-62.)

55, 56. CHAUCER. Mr. Underwood. 3 rec.; 3 cr.

57, 58. SHAKESPEARE'S PLAYS. The major histories, comedies, and tragedies. Mr. Hennessy. 3 lec.; 3 cr.

59. MILTON. Mr. Schultz. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

60. BOSWELL'S JOHNSON. Mr. Maynard. 3 lec.; 3 cr. (Not offered 1961-62.)

61. WORDSWORTH. Mr. Miller. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

62. BROWNING. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

63, 64. THE RENAISSANCE AND ENGLISH LITERATURE, 1500-1600. Mr. Schultz. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

65, 66. ENGLISH LITERATURE IN THE SEVENTEENTH CENTURY. Mr. Towle. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

67, 68. ENGLISH LITERATURE IN THE EIGHTEENTH CENTURY. Mr. Maynard. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

69, 70. THE ENGLISH ROMANTIC PERIOD. Wordsworth, Coleridge, Lamb, Byron, Shelley, Keats, Hazlitt, DeQuincey. Mr. Miller. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

DESCRIPTION OF COURSES

71, 72. VICTORIAN PROSE AND POETRY. Major non-fictional prose from Carlyle to Stevenson and major poetry from Tennyson to Hardy. Mr. Hennessy. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

73, 74. BRITISH LITERATURE OF THE TWENTIETH CENTURY. Mr. Daggett and Mr. Richardson. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

75. NEW ENGLAND RENAISSANCE. Emerson, Thoreau, and other transcendentalists. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

76. AMERICAN NOVEL IN THE NINETEENTH CENTURY. Mr. Webster. 3 lec.; 3 cr. (Alternate years; not offered 1961-62.)

77. AMERICAN POETRY OF THE NINETEENTH CENTURY. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

79, 80. AMERICAN LITERATURE OF THE TWENTIETH CENTURY. Mr. Towle. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

81, 82. INTRODUCTION TO ENGLISH DRAMA. The development of English drama, exclusive of Shakespeare, from the Middle Ages to the present. Mr. Hennessy. 3 lec.; 3 cr. (Alternate years; offered 1961-62.)

83, 84. THE ENGLISH NOVEL OF THE EIGHTEENTH AND NINETEENTH CENTURIES. Mr. Bingham and Mr. Miller. 3 lec.; 3 cr.

ENGLISH-EDUCATION. (ENGL.-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL ENGLISH. Principles and methods of teaching, literature and composition in secondary schools. For all students who plan to teach English in secondary schools, and for all students majoring in Language, History, or Education. Mr. Goffe. Prereq.: A grade of C or better in Educ. 58. Literature majors in English by permission of the instructor; all other students by fulfillment of the following: Engl. 13, 14; 16; 25; 43, 45; one semester of Engl. 57, 58; a demonstration of skill in the use of English grammar, either by the satisfactory completion of Engl. 27 or by examination. 3 lec. or rec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

ENTOMOLOGY

JAMES G. CONKLIN, *Professor*; WALTER C. O'KANE, *Professor Emeritus*;
ROBERT L. BLICKLE, *Professor*; WILLIAM R. LEE, *Assistant Professor*

2. ELEMENTARY ENTOMOLOGY. An introduction to entomology in its broad aspects. The structure, biology, and classification of insects. Each student is required to make an insect collection. Mr. Conklin. 2 lec.; 1 lab.; 3 cr.

41. INSECTS OF ORCHARD AND GARDEN. Principles of insect control; studies of the life histories, habits, and control of important insect pests of orchard, garden, and certain field crops; apparatus for applying insecticides. Mr. Conklin. 2 lec.; 1 lab.; 3 cr.

46. FOREST ENTOMOLOGY. Structure and development of insects. Orders and families of insects of importance to foresters. Principles of insect control. Biology and control of representative forest insects. Each student is required to make an insect collection. Adapted especially for Forestry majors. Open to any student. Mr. Conklin. 2 lec.; 1 lab.; 3 cr.

UNIVERSITY OF NEW HAMPSHIRE

48. BEEKEEPING. Biology of the honeybee with emphasis on behavior and colony organization; the laboratory will include practice in handling bees. Mr. Lee. 2 lec. or 2 lab.; 2 cr.

54. MEDICAL ENTOMOLOGY. Insects and arachnids in relation to public health. The more important disease carriers, their biologies, and means of control. Adapted especially for students interested in public health or medicine. Mr. Blickle. Elective for juniors and seniors. 2 lec.; 1 lab.; 3 cr.

55. HOUSEHOLD INSECTS; STORED PRODUCTS INSECTS. The problems of pest prevention and control in buildings; pests of fabrics and clothing; insects affecting foodstuffs; termites and other insects attacking wooden structures. Mr. Conklin. 1 lec.; 1 lab.; 2 cr. (Alternate years; not offered 1961-62.)

57-58. ADVANCED ENTOMOLOGY. The anatomy and physiology of insects. Systematic entomology. Mr. Conklin, Mr. Blickle, Mr. Lee. Open to others than Entomology majors by permission of the Department Chairman. 2 lec.; 2 lab.; 4 cr.

59, 60. ADVANCED ECONOMIC ENTOMOLOGY. Problems in applied entomology and apiculture; the literature of economic entomology; investigational methods; studies of the specialized phases of entomology. Mr. Conklin, Mr. Blickle, Mr. Lee. Required of Entomology majors. Open to others than Entomology majors by permission of the Department Chairman. 1 to 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

FINE ARTS

(See *The Arts*)

FORESTRY

PAUL E. BRUNS, *Professor*; CLARK L. STEVENS, *Professor*; LEWIS C. SWAIN, *Professor*; BERTRAM HUSCH, *Associate Professor*; OLIVER P. WALLACE, *Associate Professor*; HAROLD W. HOCKER, JR., *Assistant Professor*; PETER H. ALLEN, *Assistant Professor*

General Courses

1. FORESTRY PRINCIPLES. Fundamentals of forestry as applied to the orderly handling of woodlands. Mr. Swain. Elective for all students, except Forestry majors. 2 lec.; 1 lab.; 3 cr.

38. NATURE EDUCATION. Outdoor education methods, materials, and equipment. Discussion of activity programs involving forests, soils, water, and wildlife, with the recreational and educational possibilities of each. Mr. Stevens. Required for women in Physical Education, Recreation Education Option. Elective for other women students. Prereq.: Junior standing and permission of the instructor. 2 lec.; 1 lab.; 3 cr.

Forest Game Management

34. FOREST FISH AND GAME. The characteristics of the more important species present in northeastern forests, together with some consideration

DESCRIPTION OF COURSES

of the management techniques applicable to each. Mr. Allen. For juniors in Forestry. Elective for others with approval of the instructor. 2 lec.; 1 lab.; 3 cr.

55, 56. **FOREST GAME MANAGEMENT.** Readings and discussions on the properties of game populations, and the various phases of management, including public relations. The principles of forest management, and the preparation of a working plan for the management of forest and wildlife resources on a specified area. The student may be required to spend several week-ends working with the State Fish and Game Department, helping with investigational projects. Mr. Stevens. For seniors in Wildlife Management. 2 lec.; 1 4-hr. lab.; 4 cr.

Forestry

25. **DENDROLOGY.** The identification of trees in the field, in autumn and in winter. The principal forest regions of North America, their location, extent, and climatic conditions, as well as the characteristic flora and fauna of each. The forest types of the northeastern United States. Mr. Stevens. Required of freshmen in Forestry. Elective for others. 1 lec.; 1 lab.; 2 cr.

27. **SILVICS.** The ecological basis of silviculture. Classification of forest communities; environmental factors and their influence on forest vegetation; influence of vegetation on environment. Mr. Hocker. Prereq.: Bot. 1, 6. 2 lec.; 1 lab.; 3 cr.

28. **APPLIED STATISTICS.** Statistical procedures with emphasis on biometrics. Computational procedures and interpretation of results will be covered in lecture and laboratory. Mr. Husch. Prereq.: 6 cr. of Math. 2 lec.; 1 lab.; 3 cr.

29. **SILVICULTURE.** The theory and techniques of applying ecological knowledge to the control of establishment, composition, and growth of forest stands for economic purposes. Field practice including marking of stands for various kinds of cutting and cultural treatment. Mr. Hocker. Prereq.: For. 25; For. 27 or Bot. 42. 2 lec.; 1 lab.; 3 cr.

30. **SILVICULTURE.** Forest tree improvement, reproduction, collection and testing of forest tree seed, nursery management and out-planting of seedlings, direct seeding of forest stands, planting site surveys. Mr. Hocker. Prereq.: For. 27. 2 lec.; 1 lab.; 3 cr.

43. **FOREST MENSURATION.** Theory and practice in the principles of forest mensuration. A consideration of forest inventory, study of growth and yield, and volume table construction. The application of statistical procedures to forest mensuration. Mr. Husch. Prereq.: For. 28. 2 lec.; 2 lab.; 4 cr.

44. **FOREST ECONOMICS.** Application of economics and finance to the forest business. Nature of forest investments, forest taxation, and forest resources. Mr. Wallace. Prereq.: 3 cr. of Math; Econ. 1. 3 lec.; 3 cr.

51, 52. **FOREST UTILIZATION.** Methods of logging and milling in the chief lumber-producing regions of the United States; forest products, their manufacture and markets; special problems of the lumber business. Mr. Swain. Prereq.: Permission of the instructor. 2 lec.; 1 4-hr. lab. 4 cr.

57. **AERIAL PHOTOGRAMMETRY IN FORESTRY.** Elementary principles of photogrammetry with emphasis on their application to all phases of forestry. The value and use of aerial photos in forest typing, planimetric,

and topographic mapping; measurement of area and volume estimation. Mr. Husch. Prereq.: 3 cr. of Math. and permission of instructor. 2 lec.; 2 lab.; 4 cr.

59. FOREST PROTECTION. Principles of protection from fire, insects, fungi, climatic extremes, and other injurious agencies. Principles are illustrated by protection of northeastern forests. Emphasis is placed upon the development of resistant forest stands. Mr. Allen. Prereq.: Permission of instructor. 2 lec.; 1 lab.; 3 cr.

61, 62. PROBLEMS IN (A) FOREST ECOLOGY; (B) PHOTOGRAMMETRY; (C) FOREST UTILIZATION; (D) WILDLIFE; (E) MENSURATION; (F) FOREST ECONOMICS; (G) FOREST MANAGEMENT. Work to be arranged according to the needs of individual students. Staff. Prereq.: Senior standing and permission of the instructor. Hours to be arranged. 2 to 4 cr.

63. FOREST RECREATION. The extent, developments, and conflicts in the recreational use of wild lands of North America. Relationships to the conservation of natural resources are considered. Elective for juniors and seniors. Mr. Wallace. Prereq.: Permission of the instructor. 3 lec.; 3 cr.

64. FOREST INDUSTRY ECONOMY. Economy in productive enterprise — logging and manufacturing of forest products; control of harvesting costs as a factor in intensifying applied forest management; planning for minimum cost operations. Mr. Wallace. For seniors in Forestry. Prereq.: 3 cr. of Math.; Forestry 44 and 51. 2 lec.; 1 lab.; 3 cr.

66. WOOD IDENTIFICATION. The uses of lumber; physical properties and identification of the commercially important woods. Mr. Swain. Prereq.: Permission of the instructor. 2 lec.; 1 lab.; 3 cr.

69. FOREST MANAGEMENT. The management of forest areas for multiple use on an economic and ecological basis. The integration and application of business methods and the technical phases of forestry. Mr. Bruns. Prereq.: For. 29, 43 and 44. 3 lec.; 1 lab.; 4 cr.

Summer Session

41. GAME MANAGEMENT FIELD PRACTICE. Summer camp course. Field work on the University Forest at Passaconaway, N. H., and on a game management area of the White Mountain National Forest. Mr. Stevens. For students in Game Management group. Elective for others by permission of the instructor. Forty hours per week for 8 weeks. 10 cr.

42. FOREST ENGINEERING. Field practice at summer camp in forest mapping and surveying. Mr. Husch. Prereq.: For. 28, C.E. 7. Forty hours per week for 3 weeks. 4 cr.

45. TIMBER SURVEY. Field practice at summer camp in forest inventory. Field work in the application of silvicultural principles and field trips for observation and study of current practices being used on private and public forest lands. Emphasis given to commercial tree species of the northern hardwood and spruce-fir forest types. Mr. Wallace and Mr. Hocker. Prereq.: For. 43. Forty hours per week for 5 weeks. 6 cr.

53. WILDLIFE ECOLOGY PROBLEMS. Summer camp course. Special problems in the ecology of forest fish and game. Mr. Stevens. Open to advanced students or to those who show unusual promise in wildlife research. Prereq.: Permission of the instructor. Forty hours per week for 8 weeks. 10 cr.

DESCRIPTION OF COURSES

FRENCH

(See Languages)

GEOLOGY AND GEOGRAPHY

T. RALPH MEYERS, *Professor*; DONALD H. CHAPMAN, *Professor*; GLENN W. STEWART, *Associate Professor*; CECIL J. SCHNEER, *Associate Professor*; WILLIAM H. WALLACE, *Assistant Professor*; GEORGE THEOKRITOFF, *Assistant Professor*

Geology

1-2. **PRINCIPLES OF GEOLOGY.** The earth and its history. A consideration of land forms and a discussion of the materials and structures of the earth's crust. The interpretation of past geologic events, and their effect on the development of life forms. Mr. Meyers, Mr. Chapman, Mr. Stewart, and Mr. Theokritoff. 3 lec. or rec.; 1 lab.; 4 cr. *This course cannot be used for major credit.*

7. **GENERAL GEOLOGY.** An introductory course in physical geology. The structures and materials of the earth's crust and the forces which have produced and altered them. Mr. Stewart. For students in Technology and Agriculture. *Open to Liberal Arts students by permission only.* 2 lec. or rec.; 2 cr. (Not available for credit after completing Geol. 1.)

27. **PHYSICAL-CHEMICAL MINERALOGY.** An introduction to the theory of natural solids; the structure of the atom; the crystal, its geometry, its physics and chemistry, its natural history; methods of physical-chemical mineralogy. Mr. Schneer. Prereq.: Chem. 4. 2 lec.; 1 lab.; 3 cr.

28. **DESCRIPTIVE AND DETERMINATIVE MINERALOGY.** The physical and chemical properties of minerals, their associations, modes of occurrence and uses; with training in their identification. Mr. Meyers. Prereq.: Geol. 1 or 7. 2 lec.; 2 lab.; 4 cr.

31. **GEOMORPHOLOGY.** The factors producing the present aspect of the land surface, particularly that of New England. Special emphasis on the work of running water, glaciers, and marine agents. Field trips during the fall season. Mr. Chapman. Prereq.: Geol. 2 or permission of the instructor. 3 lec. or rec.; 1 lab.; 4 cr.

32. **GLACIAL GEOLOGY.** The characteristics of existing glaciers and an interpretation of Pleistocene glacial features. The abundant and varied evidence of glaciation in northeastern North America and Baltic Europe will be emphasized. New Hampshire examples of both Alpine and Continental glaciation will be studied in the field. Mr. Chapman. Prereq.: Geol. 2. 2 lec.; 1 lab.; 3 cr.

33. **STRUCTURAL GEOLOGY.** The structural units of the earth's crust and the mechanics of their formation. Mr. Stewart. Prereq.: Geol. 2 and Math. 7-8, Fundamental Mathematics, or permission of the instructor. 3 lec. or rec.; 1 lab. or field work; 4 cr.

34. **ELEMENTS OF PETROLOGY.** The origin, modes of occurrence, and classification of rocks. Mr. Stewart. Prereq.: Geol. 33. 2 lec.; 1 lab. or field exercise; 3 cr.

36. **SEDIMENTOLOGY.** The properties of sediments and sedimentary rocks, the sedimentary processes and environments, correlation procedures and basic stratigraphy in the field of petroleum and ground water geology. Mr. Theokritoff. Prereq.: Geol. 1 or permission of the instructor. 2 lec.; 1 lab.; 3 cr.

42. **FIELD GEOLOGY.** Training in basic field methods of geologic mapping. Mr. Stewart. Prereq.: Geol. 33. 1 lec.; 1 lab. or field work; 2 cr.

53-54. **ECONOMIC GEOLOGY.** First semester: the types of coal and their occurrence in the United States; petroleum, the structures in which it is found and the distribution and geology of oil fields, especially in the United States; industrial minerals and their utilization. Second semester: the metals, their ores, and the geology of important ore deposits. Mr. Meyers. Prereq.: Geol. 28. 3 lec. or rec.; 3 cr.

55. **INVERTEBRATE PALEONTOLOGY.** The classification, evolution, and stratigraphic occurrence of invertebrate animals as recorded by fossils. Field trips will be made to collect specimens and to study environments of living and fossil material. Mr. Theokritoff. Prereq.: Geol. 2, or permission of the instructor. 3 lec.; 1 lab.; 4 cr.

57, (57). **GEOLOGICAL PROBLEMS.** Special problems by means of conferences, assigned readings, and field or laboratory work, fitted to individual needs from one of the areas listed below. Mr. Meyers, Mr. Chapman, Mr. Stewart, Mr. Schneer, and Mr. Theokritoff. Prereq.: Permission of the instructor. 1-2 cr. *This course may be repeated to a total of more than 5 credits.*

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|---------------------------------|---------------------------------|
| a. Areal Geology | k. Mineralogy, Advanced |
| b. Geochemistry | l. Optical Crystallography |
| c. Geomorphology, Advanced | m. Ore Deposits |
| d. Geophysics | n. Paleontology, Advanced |
| e. Glacial Geology, Advanced | o. Petrology, Advanced |
| f. Groundwater Geology | p. Regional Geology |
| g. Historical Geology, Advanced | q. Sedimentation |
| h. Industrial Minerals | r. Stratigraphy |
| i. Micropaleontology | s. Structural Geology, Advanced |
| j. Mineral Fuels | t. Geology Seminar |

Geography

Register for the following courses as Geog. 1, etc. Courses in Geography cannot be used to satisfy the Science requirements, nor major requirements in Geology.

1, 2. **WORLD GEOGRAPHY.** A survey of the geography of the world, organized in terms of the major cultural areas of the earth. The Polar, European, and Dry World cultural areas are considered during the first semester; the Oriental, African, Pacific, and New World cultural areas are analysed during the second semester. In each area the unique integration of physical and human features that produces the distinctive personality of the region is studied. Mr. Wallace. 3 lec. or rec.; 3 cr.

DESCRIPTION OF COURSES

3. **PHYSICAL GEOGRAPHY.** The differentiation of the earth in terms of climate, landforms, vegetation, and soil; the regional synthesis of these physical features in selected areas. Mr. Wallace. 3 lec. or rec.; 3 cr. *This course is not open to students who have taken both Geog. 21 and 22.*

4. **CULTURAL GEOGRAPHY.** The geography of man. Differentiation of the earth in terms of population, settlement, and the basic economic activities, including agriculture, forestry, fishing, mining, manufacturing, and transportation. The inter-relations of cultural phenomena and physical features in selected areas. Mr. Wallace. 3 lec. or rec.; 3 cr.

(5). **POLITICAL GEOGRAPHY.** Differences and similarities among the states of the world in terms of political character. Analysis is made of the factors involved in the internal unity of states, as well as their external relations. Attention is focused upon the major world powers of the present period. Mr. Wallace. *Not open to freshmen.* 3 lec. or rec.; 3 cr. *(This course will be offered in second semester.)*

10. **GEOGRAPHY OF ANGLO-AMERICA.** A regional and topical analysis of the United States and Canada. Physical features, including climate, landforms, vegetation, and soils, and the cultural elements of population settlement, agriculture, extractive activities, manufacturing, transportation, and political phenomena in terms of their contributions to the character of the area. Mr. Wallace. *Not open to freshmen.* Prereq.: 3 hours credit in Geography or permission of instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

11. **GEOGRAPHY OF EUROPE.** A regional and topical analysis of the geography of Europe. The basic theme is the unique complex of physical and human features that produces the great diversity of Europe. Emphasis is placed upon the causal inter-relationships of phenomena, both natural and cultural, that determine the distinctive character of the areas studied. Mr. Wallace. *Not open to freshmen.* Prereq.: 3 hours credit in Geography or permission of instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

12. **GEOGRAPHY OF LATIN AMERICA.** The physical and economic geography of Mexico, Central America, and the South American countries, treated regionally. Mr. Wallace. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

21. **THE WEATHER.** The interpretation of atmospheric phenomena; the heating and circulation of the atmosphere and the nature and movement of the air masses which influence the weather of North America and particularly of New England. Mr. Chapman. 2 lec. or rec.; 2 cr.

22. **CLIMATES OF THE WORLD.** Classification of climates of the world. Examples and brief descriptions of major climate types, and their influence on the life of man. Mr. Chapman. 2 lec. or rec.; 2 cr.

57, (57). **METEOROLOGICAL OR GEOGRAPHICAL PROBLEMS.** Special problems by means of conferences, assigned readings, and laboratory work, fitted to individual needs. Mr. Chapman and Mr. Wallace. Prereq.: Permission of the instructor. 1-5 cr. *This course may be repeated to a total of not more than 5 credits.*

UNIVERSITY OF NEW HAMPSHIRE

Physical Science

(Register for this course as Ph. Sci. 1-2.)

1-2. THE EVOLUTION OF PHYSICAL SCIENCE. The principles and methods of physical science illustrated by the development of major scientific ideas in the physical world. The course is directed toward an understanding of the intellectual achievements and problems of science as part of culture. Mr. Schneer. 3 lec.; 1 lab.; 4 cr.

GERMAN

(See Languages)

GOVERNMENT

JOHN T. HOLDEN, *Professor*; ROBERT B. DISHMAN, *Professor*; ALLAN A. KUUSISTO, *Professor*; DAVID C. KNAPP, *Associate Professor*; ROBERT N. LARSON, *Assistant Professor*; JOSEPH P. FORD, *Instructor*; ARTHUR S. BANKS, *Instructor*

All students majoring in Government must take Government 5 and 6. These two courses qualify the student for his major but may not be counted for major credit.

5, (5). ELEMENTS OF POLITICAL SCIENCE. An introduction to politics and government in modern society. The scope and method of political science, the behavior of the individual and group in political society, the nature and structure of political power, and competing political ideologies, e.g., communism, elitism, democracy. Staff. Open to all students. 3 lec. or rec.; 3 cr.

(6), 6. PRINCIPLES OF AMERICAN GOVERNMENT. The origins and development of the national government in the United States. The role which legislators, administrators, judges, and the people themselves play in the governmental process and on the constitutional and political framework within which they operate. Staff. Open to all students. 3 lec. or rec.; 3 cr.

8. AMERICA IN WORLD AFFAIRS. The problems of American foreign relations. The formulation and execution of policy, the emergence of the United States as a world power, contemporary issues confronting the country, and policies adopted to meet these issues. Mr. Holden, Mr. Kuusisto, and Mr. Ford. Open to all students. 3 lec. or rec.; 3 cr.

11, 12. COMPARATIVE GOVERNMENT. First semester: parliamentary governments, including Great Britain, France, Canada, and representative smaller states. Second semester: Russia, Germany, and Japan. Mr. Kuusisto. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

13. STATE GOVERNMENT AND POLITICS. A comparative, historical and theoretical examination of the role played by the states and their governmental subdivisions in the American federal system. The relation between structure and politics in state government, and the effect of this relationship on the executive, legislative, and judicial powers. The special areas of intergovernmental relations, regional cooperation, metropolitan growth, state reorganization, fiscal management taxation, and the theories of cooperative federalism and state's rights. Mr. Ford. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr.

DESCRIPTION OF COURSES

14. **LOCAL MANAGEMENT AND PLANNING.** A survey and analysis of the growth and functions of American local government, with emphasis on county, city, and town management and planning. The historical and environmental influences on American municipal development, the growth and practice of city and town planning, management techniques, current metropolitan problems, as well as the legal and political relationships of planning and management. Such planning devices as zoning, building codes, and budget committees are examined. Mr. Ford. Prereq.: Gov. 13. 3 lec. or rec.; 3 cr.

15. **POLITICAL PARTIES AND THE ELECTORAL PROCESS.** Political parties as an instrument for the popular control of government in the United States. The way in which parties are organized, the methods by which they nominate candidates and campaign for their election, and the groups from which they draw most of their electoral support. Mr. Dishman. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

16. **PRESSURE GROUPS AND THE GOVERNMENTAL PROCESS.** Political interest groups as an unofficial "third house" of American national and state legislatures. The efforts by pressure groups to influence public officials by lobbying, propaganda, and direct political action. Mr. Dishman. Prereq.: Gov. 6. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

51. **ADMINISTRATION OF JUSTICE.** The nature, sources and problems of the law as distinguished from other forms of social control. The course is analytical and critical, tracing the origin and development of legal institutions from primitive times to the present and evaluating the modern role of judge, jury, and counsel in the administration of justice. The law in action, i.e., law as it is applied by our courts and practiced by lawyers rather than as it is formulated by the legislative and executive branches. Mr. Dishman. 3 lec. or rec.; 3 cr.

52. **THE SUPREME COURT AND THE AMERICAN CONSTITUTION.** The American Constitution, stressing the basic constitutional principles on which the American political system is founded and their application to present-day social, political, and economic problems. The powers of Congress, the President, and the federal courts and to the constitutional limitation by which their respective powers are checked. Mr. Dishman. Prereq.; Gov. 6. 3 lec. or rec.; 3 cr.

55. **WORLD POLITICS.** The basic driving forces in international relations, including the nature of political power and its extension on limitation. Geo-politics, nationalism, ideology, imperialism, international economic relations, balance of power, warfare, regulation of arms, international law, and collective security. Mr. Kuusisto. 3 lec. or rec.; 3 cr.

56. **FOREIGN POLICIES OF THE GREAT POWERS.** Fundamental factors influencing contemporary foreign policy formulation of the United States, the Soviet Union, the British Commonwealth, and other significant powers. Problems and choices confronting policy makers of these powers in dealing with issues involving the United Nations, regional organizations, Western Europe, Middle East, and Latin America. Mr. Kuusisto. 3 lec. or rec.; 3 cr.

57. **THE ADMINISTRATIVE PROCESS.** The principal concepts of governmental administration, including theories of organization, administrative leadership, internal management, and administrative responsibility and control. The relationship of group behavior and policy development to the administrative process. Mr. Larson. Prereq.: Gov. 6, or Soc. 1. 3 lec. or rec.; 3 cr.

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58. **NATURAL RESOURCES POLICY AND ADMINISTRATION.** The development and administration of public policy on land, water, and mineral resources. The historical development of governmental action in each of these areas, political conflicts on policy goals, and the administrative structure for carrying out current policies. Mr. Knapp. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr.

63. **POLITICAL THOUGHT IN THE WEST.** The principal political theories from Plato and Aristotle to the beginning of the modern liberal tradition. The growth and development of political thinking and institutions in terms of the development of modern government. The development of the modern national state and to its fundamental institutions. Mr. Holden. 3 lec. or rec.; 3 cr.

64. **MODERN POLITICAL THOUGHT.** Modern western political thought from the emergence of the nation state to the present. The meaning and growth of the basic patterns of thought on the Continent and in England, including liberalism, democracy, socialism, communism, fascism, and nazism. The contributions of American political thought as it grew from its English origins to the development of the American constitutional system. Mr. Holden. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

65, (65). **RESEARCH IN GOVERNMENT PROBLEMS.** An individual research project in one of the fields of government, e.g., local or state administration, comparative government, international relations, international organizations, political theory, politics, or public law to be prepared under the direction of a member of the staff. The method and sources of research in government. Members of the Department. Open to senior majors in Government. 3 cr.

67. **PUBLIC POLICY AND INDUSTRY.** The role of government in promoting, regulating, and operating industry in certain key sectors of the American economy. Tariff policy and subsidies, the antitrust and "fair trade" laws, unfair labor practices and the settlement of labor disputes, public utility regulation, and the operation of the Tennessee Valley Authority and other publicly-owned enterprises. The legal and political problems confronting New England will be emphasized. Mr. Dishman. Prereq.: Gov. 6, or Econ. 1-2. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

69. **CONTEMPORARY SOUTHEAST ASIA.** A comparative study of the political and social development of Southeast Asia. The significance of the role of independence and dependence; the competing influence of communism and Western democracy; the special significance of the role of China, India, Great Britain, and the United States. The states to be studied include the Philippines, Laos, Cambodia, Viet Nam, Viet Minh, Thailand, Burma, Malaya and Indonesia. Mr. Holden. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

97, (97). **SEMINAR IN GOVERNMENT.** A selected current topic from government, political philosophy and history, political behavior, public law, public administration, or international relations will be the vehicle for this seminar. Each student is held responsible for a specific phase of the selected problem. He will also, through the techniques of the seminar, acquaint himself with the whole project. The course is restricted to undergraduates with honor grades and graduate students in Social Science. Advance copies of the syllabus may be secured from the Chairman of the Department. Permission of the instructor is required. Mr. Holden, Mr. Dishman, Mr. Kuusisto, Mr. Knapp, Mr. Ford. 3 lec. or rec.; 3 cr.

DESCRIPTION OF COURSES

HISTORY

PHILIP M. MARSTON, *Professor*; WILLIAM YALE, *Professor Emeritus*; DAVID F. LONG, *Professor*; GIBSON R. JOHNSON, *Associate Professor*; ALLAN B. PARTRIDGE, *Associate Professor*; HANS HEILBRONNER, *Associate Professor*; ROBERT C. GILMORE, *Assistant Professor*; CHARLES A. JELLISON, JR., *Assistant Professor*; WILLIAM GREENLEAF, *Assistant Professor*; MARION E. JAMES, *Assistant Professor*

In these courses an important place is given to historical reading carried on in the reference room. Often a considerable part of the work is written.

The statements in regard to prerequisites are for Liberal Arts students. Agriculture and Technology students should consult the Department Chairman.

Basic Course

The following is a basic course which is required of all students in the College of Liberal Arts.

1, 2. INTRODUCTION TO CONTEMPORARY CIVILIZATION. A background of appreciation of the social significance of man's environment, the nature of man, the cultural heritage from the past, recognition of historical allusions in literature and conversation, and knowledge of the general sequence of historic events. Prehistoric and historic social evolution. The historic explanation of modern life and an appreciation of the problems of contemporary society. Mr. Gilmore, Mr. Greenleaf, Mr. Heilbronner, Miss James, Mr. Jellison, Mr. Johnson, Mr. Long, and Mr. Partridge. 3 lec. or rec.; 3 cr. *This course cannot be used to satisfy major requirements.*

Group A

11, 12. THE MEDITERRANEAN WORLD IN ANCIENT AND CLASSICAL TIMES. The contributions made by the peoples of the Ancient Near East, the Hellenic and Hellenistic civilizations, and the Romans to Western civilization. Miss James. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Not open to students who have credit for the former History 11, 12, 13.)

19, 20. MODERN EUROPEAN HISTORY. Europe from the end of the Middle Ages to our own times. The evolution of the national state; international relations; the expansion of Europe overseas; and the background of our modern Western civilization especially its ideas, literature and art. A basic course for those who wish to proceed further in the study of European history as well as a survey for those who are interested in special aspects of Western cultural development. Mr. Gilmore. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

21, 22. HISTORY OF ENGLAND. The history of the British Isles from earliest times to the present, and a consideration of the British Empire and Commonwealth of Nations. A parallel to English literature, a background to American political history, and a study of English culture and institutions in the democratic and social integration of the world. Mr. Partridge. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

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31, 32. **ASIA IN TRANSITION.** The old and the new China, Japan, and India. A general introduction to the changes taking place in Asia. The impact of Europe, Russia, and America in the East. The response of the East in the form of political and cultural evolution and revolution. The rise and development of Chinese Communism. A basic course for those interested in cultural, political, industrial, or business developments in the East, and a general course for an understanding of the East. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Formerly Hist. 75, 76.)

71, 72. **HISTORY OF RUSSIA.** The development of the Russian state from its foundation to its present status as a world power. The course is designed to increase the understanding of the present in terms of the past. Political developments, foreign relations, and intellectual and ideological currents. Mr. Heilbronner. 3 lec. or rec.; 3 cr.

Group B

7, 8. **HISTORY OF THE UNITED STATES.** American history from Washington's first administration to the present. Political, social, economic, and diplomatic aspects. Mr. Greenleaf and Mr. Long. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

9, 10. **LATIN-AMERICAN HISTORY.** The development and influence of Spanish and Portuguese culture as a wide spread world force; the history of the Latin-American peoples; the relationship of Latin America to North America, particularly in view of recent growth in friendly and diplomatic relations. Mr. Partridge. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

51, 52. **COLONIAL AND REVOLUTIONARY AMERICAN HISTORY.** Colonial beginnings in America, national rivalries, the English colonies, the Revolution, and our national life to 1789. Early forms of Americanism in the making. Mr. Marston. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

59, 60. **SOCIAL AND CULTURAL HISTORY OF NEW ENGLAND.** From the settlements to the present. The material and intellectual aspects peculiar to New England's social and cultural life. It is assumed that the student is familiar with the general history of New England. Mr. Marston. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

83, 84. **THE FOREIGN RELATIONS OF THE UNITED STATES.** Primarily the history of American diplomacy, with attention given to the non-diplomatic aspects of foreign relations. Mr. Long. 3 lec. or rec.; 3 cr.

85, 86. **TWENTIETH-CENTURY AMERICA.** United States history since 1896, from the triumph of industrialism on the national scene to the emergence of America as a world power in the nuclear age. Political, economic, and diplomatic developments. Mr. Greenleaf. 3 lec. or rec.; 3 cr.

87, 88. **NINETEENTH-CENTURY AMERICA.** The historical factors, both domestic and international, involved in the development of the American Republic, its institutions and people, from the inception of the new nation in 1789 to the emergence of the United States as a world power in 1900. Mr. Jellison. 3 lec. or rec.; 3 cr.

Group C

23, 24. **HISTORICAL ORIGINS AND DEVELOPMENT OF CHRISTIANITY.** The life, literature, religion, and social development recorded in the Old Testament as a cultural background. The historic data existing concerning the life,

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character, and teaching of Jesus. The growth and expansion of the Christian movement. Designed to furnish students an opportunity to evaluate their own religious heritage in the light of contemporary thought. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; (Alternate years; not offered 1961-62.)

25. HISTORY OF RELIGION. The leading ideas and practices, historically regarded as religious, with a view to working out an historically valid conception as to the nature of religion. The impact of the scientific revolution upon the supernatural world view and the consequent relegating of religion to a secondary place. The modern naturalistic world view as an intellectual basis for religious living, and traditional Christian beliefs in the terminology of our age. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

26. HISTORY OF RELIGIONS. The principal religions of the world; Hinduism, Buddhism, Zoroastrianism, Confucianism, and Mohammedanism. The history, literature, and philosophy of Oriental civilization and culture as a background. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

HISTORY-EDUCATION 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL HISTORY AND OTHER SOCIAL STUDIES. Bibliography and new interpretations of history; the social studies curriculum, past and present; aims and objectives in the social studies; selection and organization of teaching material; teaching and testing technique. Teaching American History and the Problems of American Democracy. Mr. Long. Open to students who have satisfactorily completed Hist. 7, 8; six credits in other history courses (*exclusive of Hist. 1, 2*); six credits from Gov. 6, Econ. 1, or Soc. 1; and Educ. 58 with a grade of C or better. 3 lec. or rec.; 3 cr. (*This course may not be used to satisfy major requirements.*)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

HOME ECONOMICS

ANNA LIGHT SMITH, *Professor*; SARAH THAMES, *Associate Professor*; ELIZABETH RAND, *Associate Professor*; FRANCES PLATTS, *Associate Professor*; RUTH PEARCE, *Assistant Professor*; DOROTHY WILLS, *Assistant Professor*

Child Development and Home and Family Living

25-26. CHILD DEVELOPMENT. The development and guidance of the child from the prenatal to the adolescent period, with emphasis on the preschool child through observation and work at the University Nursery School. Study of children in other situations may be included during the second semester. *Not open to freshmen.* 2 lec. or rec.; 1 lab.; 3 cr.

81, 82. PROJECTS IN CHILD DEVELOPMENT. Discussion conferences and supplementary projects based upon special interests of the student. Work with children in the University Nursery School or in other situations. Prereq.: H.E. 25-26 and permission of the instructor. 1-3 cr.

83. FAMILY DEVELOPMENT. Family growth through predictable stages of development which can be understood in terms of the development of the individual members and of the family-as-a-whole. The characteristics of the

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American family life cycle in mid-twentieth century; the family from its inception at marriage through the period of expansion, the middle and later years. Services needed for family stability and success. 3 lec. or rec.; 3 cr.

84. PERSONAL, FAMILY, AND COMMUNITY HEALTH. The principles which promote healthful living and their application to members of the family and to routine home nursing care. 3 lec.; 1 lab.; 2 cr.

Clothing and Textiles

4. TEXTILES. The textile fibers and their characteristics, the manufacture of yarns and fabrics, and the finishing processes applied to fabrics as related to the ultimate use of textile materials. Prereq.: Chem. 1 or 3, and Chem. 2 or 4 concurrently. 2 lec. or rec.; 1 lab.; 3 cr.

5. PRINCIPLES OF CLOTHING CONSTRUCTION AND DESIGN. Basic principles and experience in using commercial patterns and the application of principles of design to costume. Two sections: one for clothing and textile majors, one for non-majors. Prereq.: Permission of instructor. 2 lec.; 1 lab.; 3 cr.

31. INTERIOR DESIGN. An application of the principles of design to the decorating of the home. Not open to Home Economics majors. Prereq.: Arts 23. 3 lec.; 3 cr.

32. INTERIOR DECORATION. An application of the principles of design to the decoration of the home together with laboratory experience in the construction of home furnishings and renovation of furniture. Prereq.: Arts 23 and H.E. 5. 1 lec.; 2 labs.; 3 cr.

46. INSTITUTIONAL TEXTILES. Selection of fabrics for institutional use. New developments in serviceability, care, and costs of institutional textiles and appointments. Prereq.: Permission of instructor. 2 lec.; 1 lab.; 3 cr.

60. FLAT PATTERN. The principles of developing designs from a basic pattern by the flat pattern method and the development of original patterns and garments. Prereq.: H.E. 5. 2 lec.; 1 lab.; 3 cr. Not open to graduate students.

61. TAILORING. The appreciation and application of tailoring principles to making and buying a tailored garment. Prereq.: H.E. 5, and one of the following: H.E. 60 or 63. 2 lec.; 1 2-hr. lab.; 3 cr.

63. DRAPING. Basic principles of fabric manipulation in the draping processes and the evolution of patterns and garments through this method. Prereq.: H.E. 5. 2 lec.; 1 2-hr. lab.; 3 cr. Not open to graduate students.

65. HISTORY OF COSTUME. An appreciation of costume (and textiles) from primitive times to the present and the relationship of the mores of each period to the development of the costume for the respective era. Open only to juniors and seniors. 3 lec. or rec.; 3 cr.

66. COSTUME DESIGN. The development of some skill in the delineation of fashion figures, and the sketching of original costume designs derived from various sources of inspiration. Prereq.: H.E. 5. H.E. 65 is recommended. 2 labs.; 2 cr.

(67). FUNDAMENTALS OF FASHION. Economical, psychological, and sociological problems inherent in the field of fashion. The development of the fashion industry. Prereq.: Econ. 25, B.A. 46, Psych. and Soc. electives. 2 labs.; 2 cr.

DESCRIPTION OF COURSES

69. **ADVANCED TEXTILES.** The chemical and physical testing of textiles. Assigned readings of technical literature in the field. Prereq.: H.E. 4, Chem. 45, Phys. 1, and Bact. 1. 1 lec. or rec.; 2 lab.; 3 cr.

Foods and Nutrition

(12). **FOODS.** The application of the principles involved in the purchase and preparation of food. Menu planning, meal preparation, and field trips to nearby food service centers. For Non-Home Ec. majors. 2 lec.; 1 lab.; 3 cr.

(18), 18. **PRINCIPLES OF FOOD SELECTION AND PREPARATION.** The scientific principles involved in selection, composition, preparation, preservation, and economics of food. Recent food developments, such as mixes and newer methods of preparation. Prereq.: Chem. 1 or 3, and Chem. 2 or 4 concurrently. 2 lec.; 1 2-hr. lab.; 3 cr.

(19). **MENU PLANNING AND SERVICE.** The planning, preparation, and service of meals with emphasis on food economics and the efficiency and utilization of new methods and equipment. Prereq.: H.E. 18. 2 lec.; 1 lab.; 3 cr.

71. **EXPERIMENTAL FOODS.** Techniques of research and technological advances in the preparation and preservation of foods. Experiments with specific foods in the laboratory. Prereq.: H.E. 18; Bio. Chem. 6 or concurrently with Bio. Chem. 56. 2 lec.; 1 2-hr. lab.; 3 cr. (Alternate years; offered 1961-62.)

73. **NUTRITION.** The fundamental principles of the physiological and social sciences and their relationships to human nutrition. The nutritive value of foods, essential nutrients which promote growth and health, effect of food on the body, and adjustment of diet to varying income levels. Prereq.: Bio. Chem. 6 or concurrently with Bio. Chem. 56, and H.E. 18. 2 lec.; 1 lab.; 3 cr.

74. **NUTRITION IN HEALTH AND DISEASE.** Modifications of the normal diet and how nutrition is used as a therapeutic measure in the treatment of disease. Prereq.: H.E. 73. 2 lec.; 1 lab.; 3 cr.

75. **ADVANCED FOODS.** The chemical and physical properties of foods and discussion of current research. Prereq.: H.E. 18; Bio. Chem. 6. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

76. **NUTRITION SEMINAR.** Discussion of research and experimental work in human nutrition. Exploration of current periodicals, reports, and assigned readings. Prereq.: Permission of the instructor. 3 rec.; 3 cr.

86. **FOOD TRENDS AND DEVELOPMENTS.** The newest developments in food production, selection, preparation, and preservation. Electronic cookery; the preparation, use, and evaluation of new home and institutional mixes; and modern trends in the planning, preparation, and serving of "jiffy" meals will be presented in lecture, demonstration, and laboratory sessions. Field trips to nearby food service centers will be planned for the group. 3 lec.; 1 lab.; 4 cr.

Home Economics Education

91. **METHODS IN HOME ECONOMICS EDUCATION.** The objectives and methods of Home Economics education. Their applicability to a variety of situations and media. Prereq.: Educ. 57-58, 59. 2 lec.; 1 lab.; 3 cr.

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93. **NUTRITION EDUCATION.** The principles, procedures, and problems involved in the educational program for dietitians and nutritionists. Prereq.: H.E. 73, 74, and Psych. 1. 3 lec.; 3 cr.

94. **SUPERVISED TEACHING IN HOME ECONOMICS.** Eight weeks of supervised teaching. Prereq.: Educ. 57-58, 59, and H.E. 91. 7 cr.

96. **SEMINAR IN HOME ECONOMICS EDUCATION.** Problems encountered by students after having completed supervised teaching. Assigned readings and discussions of the current literature in the field of home economics education. For seniors majoring in Teacher Preparation. Hours to be arranged. 3 cr. Offered last eight weeks of second semester.

98. **PREPARATION AND EVALUATION OF ILLUSTRATIVE MATERIALS.** The preparation of display cases, bulletin boards, posters, and other illustrative materials pertaining to home economics. Each student will have an opportunity to work in her major area. Open to juniors and seniors in Home Economics. 2 lec.; 2 lab.; 2 cr. Offered last eight weeks of second semester.

Home Management

33. **HOME MANAGEMENT.** The management of human and material resources in daily home living. Open to juniors and seniors. 2 lec.; 1 lab.; 3 cr.

35, (35). **HOME MANAGEMENT RESIDENCE.** Management principles in the operation of the home. Students live in the Elizabeth DeMerritt House for a period of seven weeks. Married students registering for H.E. 35, and residing with their husbands, may fulfill the requirements of the course by living in the House or by carrying out a supervised program in their own home. Those not residing with their husbands at the time the course begins shall live in the House for the course period. Prereq.: H.E. 33 and permission of instructor. For juniors and seniors. Offered twice each semester. 3 cr.

HOUSING AND EQUIPMENT. (See Agricultural Engineering 2.)

Institutional Administration

51-52. **QUANTITY FOODS AND PURCHASING.** The quantity production and buying of food. Principles of large quantity methods and standards as applied to hotels and institutions. Laboratory work in the quantity cookery laboratory and University Dining Hall kitchens. Prereq.: H.E. 18. 1 lec.; 1 4-hr. lab.; 3 cr.

53. **ORGANIZATION AND MANAGEMENT OF INSTITUTIONAL FOOD SERVICE.** Problems of personnel policies, menu planning, production and merchandising, plant planning, maintenance, and sanitation as related to institutional food service. Prereq.: H.E. 51-52. 3 lec. or rec.; 3 cr. This course may be taken concurrently with H.E. 55.

55, (55). **INSTITUTIONAL ACCOUNTING AND FOODS CONTROL.** Methods of controls and systems of food cost accounting used in food service operations. Prereq.: H.E. 53 or may be taken concurrently with H.E. 53. 2 lab.; 2 cr.

56, (56). **CATERING.** Experience in planning and executing special parties of various types. Prereq.: H. E. 51, 52. 2 labs.; 2 cr.

Field Work

(48), 48. **FIELD WORK.** Residence and experience in an approved hospital or other type of institution for students majoring in Foods, Nutrition,

DESCRIPTION OF COURSES

and Institutional Administration. Field work experiences may be elected by other Home Economics majors. See curriculum requirements. Prereq.: Approval of adviser. 2-6 cr.

HORTICULTURE

WILLIAM W. SMITH, *Professor*; ALBERT F. YEAGER, *Professor Emeritus*; J. RAYMOND HEPLER, *Associate Professor Emeritus*; L. PHELPS LATIMER, *Associate Professor Emeritus*; RUSSELL EGGERT, *Associate Professor*; JOHN T. KITCHIN, *Associate Professor*; OWEN M. ROGERS, *Assistant Professor*

General Horticulture

2. PLANT PROPAGATION. Discussion and practice including soil, sand, and peat media; seed treatments, seeding, watering, light, feeding, and temperatures; leafy, softwood, and hardwood cuttings; hormone treatment; budding, root, top and bridge-grafting; seedbed nursery practice. Mr. Rogers and Mr. Smith. 1 lec.; 2 cr.

4. GENERAL HORTICULTURE. The principles and practices of horticulture, including fruits, vegetables, and ornamentals, as they apply to both commercial production and the growing of plants in and around the home. Staff. 2 lec.; 1 lab.; 3 cr. (Not offered 1961-62.)

13. HORTICULTURAL PRODUCTS AND JUDGING. Selection of fruits, vegetables, and flowers for exhibition, marketing, and domestic use. The management and judging of small fairs and exhibition. A wide range of plants and varieties, both fresh and frozen, are used as class material. Required of all Horticulture majors and recommended for others who are training for such positions as county agricultural agents, home demonstration agents, club leaders, or Smith-Hughes teachers. Mr. Kitchin assisted by Mr. Eggert. 2 lab.; 2 cr.

66. NURSERY MANAGEMENT. The development of the nursery business. Factors that influence the location of a nursery, layout of the plant, soil and site, types of plants, pest control, inspection, digging, grading, storage, packing, shipping, and sales. Mr. Eggert. Prereq.: Plant Propagation. 1 lec.; 1 lab.; 2 cr.

91, 92. HORTICULTURE SEMINAR. A review of current horticultural literature and techniques in horticultural research. Students are required to prepare and present papers on selected topics. Mr. Smith. This course may be repeated for credit. 1 lec.; 1 cr.

94. PLANT BREEDING. Application of the principles of genetics to practical plant breeding. Hybridization, chemical treatments, and selection as means of producing and improving varieties. Mr. Rogers. Prereq.: Zool. 61. 2 lec.; 1 lab.; 3 cr.

95, 96. INVESTIGATIONS IN: (a) Fruits, (b) Flowers, (c) Vegetables, (d) Ornamentals, (e) Plant Breeding. Elective only upon consultation with Chairman of Department. Mr. Smith, Mr. Eggert, Mr. Kitchin, Mr. Rogers. Hours to be arranged. 1 to 4 cr.

Fruit Crops

53. ORCHARD FRUITS. Examination of fundamental principles and experimental data and their applications to orchard problems, including the

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establishment of orchards, soil management, water and fertilizer requirements, mineral deficiencies, training and pruning, fruit bud formation, pollination and fruit setting, thinning and winter injury. Mr. Eggert. 3 lec.; 3 cr.

54. **SMALL FRUITS.** The culture and economic uses of the strawberry, raspberry, blackberry, blueberry, cranberry, and grape. Each fruit is considered with relation to its history, propagation, planting, pruning, harvesting, marketing, insects and diseases, and domestic uses. Mr. Eggert and Mr. Smith. 3 lec.; 3 cr.

55. **SYSTEMATIC SURVEY OF FRUITS.** Important species and their botanical relationships. The history, distribution, and merits of each species, and the horticultural varieties developed from it. Staff. Prereq.: General Botany. 2 lec.; 2 cr. (not offered 1961-62.)

Vegetable Crops

57. **SYSTEMATIC SURVEY OF VEGETABLES.** Important species of vegetables and culinary herbs and their botanical relationships. The history, distribution, and commercial merit of each species and the horticultural varieties developed from it. Mr. Kitchen. 2 lec.; 2 cr.

63. **THE DEVELOPMENT OF THE VEGETABLE INDUSTRY.** Similarities and differences in management of vegetable production for fresh market, processing, seed, and roadside sales and home use. The significance of the plant processes of photosynthesis, respiration, and the translocation to the vegetable growers. Environmental factors of soil, temperature, and moisture as they affect vegetable production. The management and role of plant growing structures, seed testing, variety selection, nutrition, weed control, and irrigation in the home garden and commercial plantings. Mr. Kitchen. 2 lec.; 1 lab.; 3 cr.

64. **THE COMMERCIAL PRODUCTION, STORAGE, AND MARKETING OF SEVERAL DIFFERENT VEGETABLE CROPS.** The management and methods of culture, weed control, insect and disease control, nutrition, irrigation, and marketing of different types of vegetables and in different soils. The use of limitations of specialized equipment and chemicals together with a review of recent experimental work in vegetable production. Mr. Kitchen. 2 lec.; 1 lab.; 3 cr.

Ornamentals and Floriculture

27. **LANDSCAPING THE HOME GROUNDS.** The design and maintenance of small properties with emphasis on the principles of arrangement and the use and identification of plant materials in the beautification of home surroundings. Mr. Rogers. 2 lec.; 1 lab.; 3 cr.

37. **FLORAL ARRANGEMENT.** Floral design and the use of flowers in the home; practice in floral arrangement. A laboratory fee of \$5.00 is charged. Mr. Rogers. Prereq.: Permission of the instructor. 1 lab.; 1 cr.

46. **OUTDOOR FLOWERS.** Outdoor flowers that are commonly grown in the temperate region, including climatic requirements, principal varieties, and utilization. Mr. Rogers. Prereq.: Hort. 2 and Bot. 1. 2 lec.; 1 lab.; 3 cr. (Not offered in 1961-62.)

59. **GREENHOUSE MANAGEMENT.** Modern methods of greenhouse management including soils, watering, costs of production and marketing, and

DESCRIPTION OF COURSES

fundamentals of plant behavior under glass. Mr. Rogers. 2 lec.; 1 lab.; 3 cr.

78. COMMERCIAL GREENHOUSE CROPS. A survey of the principal greenhouse crops and an intensive study of their individual culture. Mr. Rogers. Prereq.: Greenhouse Management. 2 rec.; 1 lab.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

HOTEL ADMINISTRATION

DONALD E. LUNDBERG, *Professor*

The courses listed below are primarily for students in Hotel Administration. Other students are invited to elect these courses provided they have the prerequisites.

1. INTRODUCTION TO HOTEL MANAGEMENT. The scope of the hotel business, both resort and commercial. A history of hospitality. The development of resort and commercial operations in the U. S. 2 lec.; 1 cr. *Required of freshmen in Hotel Administration.*

30. RESORT MANAGEMENT PRACTICUM. Field work of at least 70 days in the Forest Hills Hotel or similar operation. A weekly seminar, weekly reports, and job studies are parts of the course. Hotel Ad. majors only. 4 cr.

31. PRACTICUM IN COMMERCIAL HOTEL OPERATION. Field work lasting at least 70 days. This work covers the front of the house including engineering department. Hotel Ad. majors only. 2 cr.

32. PRACTICUM IN COMMERCIAL HOTEL OPERATION. Field work lasting at least 70 days. This work covers the back of the house and includes the housekeeping department. Hotel Ad. majors only. 2 cr.

33. PRACTICUM IN CLUB MANAGEMENT. Experience on the job of at least 70 days in an approved city or country club. Written reports are required and rotation of work around the front and the back of the club is necessary. Hotel Ad. majors only. 2 cr.

34. PRACTICUM IN INSTITUTIONAL FOOD SERVICE. Field work of at least 70 days duration in an approved school or hospital food service. Job studies and written reports are required. Hotel Ad. majors only. 2 cr.

40, 42, 44, 46. LECTURES ON HOTEL MANAGEMENT. Delivered by representative and well-known men in the hotel business and allied fields. $\frac{1}{2}$ cr. for each course.

55. HOTEL OPERATION. The problems of hotel management. The organization, personnel, and work of the departments, front office procedure, rate structure, and the methods of securing and financing a hotel business. The point of view of the resort operator is constantly compared with that of the man in the year-round hotel. B.A. 9-10 should precede or accompany this course. 3 rec.; 3 cr.

HOTEL ACCOUNTING. (See B.A. 1-2, 9-10.)

DRAFTING AND SPACE PLANNING. (See Arts 20.)

FOODS. (See H.E. 18, 51-52.)

PERSONNEL MANAGEMENT. (See Psych. 32.)

TEXTILES AND FURNITURE. (See H.E. 46.)

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56. **HOTEL ENGINEERING PROBLEMS.** Basic principles of electricity and heat; laundry practices and equipment; kitchen planning and layouts; pumps and vacuum systems; water supply and use; fire protection; other mechanical problems of operating hotel or motel buildings. 3 lec.; 1 lab.; 4 cr.

66. **HOTEL PROMOTION AND SALES.** The principles and practices used in building hotel and restaurant sales. Taught by the project method. 3 lec.; 3 cr.

67. **STEWARDEDING AND CATERING.** Purchasing, receiving, and storing of foods. Planning and preparation of catered functions. 1 lec.; 4-hrs. lab.; 3 cr.

68. **PERSONNEL AND LABOR RELATIONS IN HOTELS AND RESTAURANTS.** The application of the principles of personnel management and labor relations to the hotel and restaurant business. 3 lec.; 3 cr.

69. **HOTEL HONORS SEMINAR.** A research and problems course concerned with advancing knowledge in the hotel and restaurant field. 3 lec.; 3 cr.

HUMANITIES

Register for this course as Hu. 1-2.

1-2. **HUMANITIES.** A course in general education involving the departments of Languages, English, Music, The Arts, and Philosophy, giving an appreciation of literature, the various arts, and philosophy. The course will operate within an historical framework, but is not intended to be an historical survey. Weekly lectures or demonstrations, readings, slides, films, recordings, class recitations, and discussion. There will be at least one museum trip each semester. Mr. Casas, Mr. Daggett, Mr. Fasanelli, Mr. Maynard, Mr. Asher Moore, and guest lecturers. *Not open to freshmen.* 1 lec. and 3 rec.; 3 cr.

LANGUAGES

R. ALBERTO CASAS, *Professor*; CLIFFORD S. PARKER, *Professor Emeritus*; JOHN S. WALSH, *Professor*; JAMES C. FAULKNER, *Associate Professor*; ALEXANDER P. DANOFF, *Assistant Professor*; RALPH H. CRYESKY, *Assistant Professor*; CHARLES H. LEIGHTON, *Instructor*; DAVID A. COLLINS, *Instructor*; PAUL CHASSE, *Instructor*

General Language and Literature

Register for the following courses as Lang. 1, etc.

1, 2. **SURVEY OF GREEK AND ROMAN LITERATURE.** The masterpieces of Greek and Roman literature in translation. Through the study of literature, the students will learn about the ancient civilization from which much of our contemporary culture has come. A cultural course for the student unprepared to read the original languages but desiring acquaintance with the subject matter. A background course for majors in such subjects as English, History, Latin, or the modern languages and literatures. Continued in Languages 51, 52. Mr. Walsh. *Not open to freshmen.* 3 rec.; 3 cr.

51, 52. **SURVEY OF MODERN EUROPEAN LITERATURE.** The Renaissance, classicism, romanticism and realism studied as international movements. Stress

DESCRIPTION OF COURSES

is not upon the details of each national literature, but upon the interdependence of the literatures of the various countries. Conducted in English. 3 rec.; 3 cr.

73. INTRODUCTION TO ROMANCE PHILOLOGY. The historical development of French and Spanish from Vulgar Latin, phonology, morphology, syntax, semantics, etymology. Frequent reference is made to the spoken languages of today as well as to comparative semantics. Mr. Cryesky. Prereq.: One year of Latin and familiarity with two Romance Languages. 3 rec.; 3 cr. (Alternate years; not offered 1961-62.)

LANGUAGE-EDUCATION (LANG-Ed) 91. PROBLEMS IN THE TEACHING OF MODERN LANGUAGES IN THE HIGH SCHOOL. The special objectives, methods, and devices of modern language teaching in high school. For prospective teachers of French, German, and Spanish. Prereq.: Education 58 with grade of C or better (or one year of teaching experience) and one of the following courses: French 6 and 8, or German 6 or 14, or Spanish 3 or 4 or 6. 3 rec.; 3 cr.

FRENCH

Register for the following courses as Fr. 1, etc.

New students will be assigned to French 1, French 2, French 3, French 4, or French 5 on the basis of their performance in the French placement examination.

*1. ELEMENTARY FRENCH. Elements of French for those students without previous knowledge of the language. Aural-oral practice and the study of fundamental speech patterns to achieve a firm basis for an active command of the language, and later the reading of simple prose and writing. The course content is integrated with Intermediate French. *No credit toward a major.* 5 rec. per week, 2 hrs. of laboratory; 5 credits. *(Students who offer two entrance units or two years of high school work in French, will not be permitted to register for credit. They may, however, audit the course with proper authorization.)*

†2. INTERMEDIATE FRENCH. A continuation of French 1 with emphasis on more advanced speech patterns, vocabulary, idioms and syntax. The course is devoted to audio-lingual adaptation, more advanced reading, and writing, and grammar review. 5 rec.; 2 hrs. lab.; 5 cr. *No credit toward a major.*

3. FRENCH CONVERSATION. Practice in conversation and in improvement of pronunciation. For students who wish to develop audio-lingual skills. Prereq.: French 2 or its equivalent. 3 rec.; 3 cr.

4. FRENCH COMPOSITION. Functional review of grammar and vocabulary building. Free composition. Prereq.: French 2 or its equivalent. 2 rec.; 2 cr.

5, 6. SURVEY OF FRENCH LITERATURE. French literature from its origins to the twentieth century. Prereq.: French 2 or its equivalent. 3 rec.; 3 cr. *Required of majors in French.*

* The content of this course is equivalent to Elementary French 1-2 under the former system.

† The content of this course is equivalent to Intermediate French 3-4 under the former system.

No student from a foreign country will be permitted to register for any language course numbered 4 or below (except Greek 1-2, 3-4) in such student's native language.

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7, 8. FRENCH CIVILIZATION. Background studies for students in literature and the social sciences. Prereq.: French 2 or permission of the instructor. 2 rec.; 2 cr.

51. FRENCH LITERATURE OF THE MIDDLE AGES. Old French literature in modern French translation from its origins to the Renaissance. Prereq.: French 5 and 6. 2 rec.; 1 hr. arranged; 3 cr. (Not offered 1961-62.)

52. FRENCH LITERATURE AND THOUGHT OF THE RENAISSANCE. The works of Villon, the Pleiade, Rabelais and Montaigne. Collateral reading and reports. Prereq.: French 5 and 6. 2 rec.; 2 cr. (Offered 1961-62.)

53. THE FRENCH THEATER. The evolution of French drama from its origins to the early 19th century. Prereq.: Fr. 5 and 6. 3 rec.; 3 cr. (Not offered 1961-62.)

54. EIGHTEENTH CENTURY FRENCH THOUGHT. The literary and philosophical currents, including the precursors of The Age of Reason and the works of Montesquieu, Voltaire, the *encyclopedistes* and Rousseau. Prereq.: Fr. 5 and 6. 3 rec.; 3 cr. (Not offered 1961-62.)

55. HISTORY OF THE FRENCH NOVEL. Its origins to the twentieth century with special emphasis on its development in the nineteenth century. Lectures, recitations, and reports. Prereq.: Fr. 5 and 6. 3 rec.; 3 cr. (Offered 1961-62.)

56. MODERN FRENCH DRAMA. The development of the French theater from the Romantic period to the present. Prereq.: Fr. 5 and 6. 3 rec.; 2 cr. (Not offered 1961-62.)

57. CONTEMPORARY FRENCH PROSE. The major authors of the twentieth century with attention to artistic, ethical, and moral concepts as related to the intellectual currents of the period. Prereq.: Fr. 5 and 6. 3 rec.; 3 cr. (Not offered 1961-62.)

58. FRENCH LYRIC POETRY. An interpretive and analytical study of lyric verse in French literature. Prereq.: Fr. 5 and 6. 3 rec.; 3 cr. (Not offered 1961-62.)

61. ADVANCED FRENCH CONVERSATION. For those who wish to develop fluency and audio-lingual skills for specialized use. Students are expected to have elementary fluency in the language. Recitations include discussions of assigned materials, *explication de texte*, oral translation, interpreting techniques, discourses, critiques, in addition to making tapes and using advanced laboratory techniques. 2 rec.; 1 lab.; 3 cr. Prereq.: French 3 or its equivalent. (Offered 1961-62.)

62. ADVANCED FRENCH COMPOSITION. Practice in free composition and stylistics. Open to qualified students with the consent of the instructor. Emphasis on writing of French in relation to the stylistic study of selected texts. Some time will be devoted to a review of formal grammar. 2 rec.; 2 cr. (Offered 1961-62.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
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DESCRIPTION OF COURSES

German

Register for the following courses as German 1, etc.

New students will be assigned to German 1, German 3, or German 13 on the basis of their scores on the German reading examination.

***1-2. ELEMENTARY GERMAN.** Elements of German grammar, reading of simple prose, oral practice. 3 rec.; 2 ½-hr. lab.; 3 cr. (*Students who offer two entrance units [two years of high-school work] in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.*) Cannot be counted for major credit.

***3-4. INTERMEDIATE GERMAN.** To improve the student's ability to read, speak, and write German and to satisfy the needs of students of agriculture, engineering, and medicine. Mr. Danoff. Prereq.: Ger. 2 or its equivalent. 3 rec.; 2 ½-hr. lab.; 3 cr.

5-6. CIVILIZATION AND LITERATURE. A clear and complete view of German literature. The principal directions of German literature from its origins to the present. The interrelation of history and literature. Collateral readings. Prereq.: Ger. 4. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

13-14. GERMAN COMPOSITION AND CONVERSATION. For students who desire a fluent practical command of spoken and written German. Approximately two thirds of the class time will be devoted to conversation; the remaining part to composition and readings which will provide subject matter for oral work. Prereq.: Ger. 4. 3 rec.; 3 cr. (Not offered 1961-62.)

53-54. GERMAN LITERATURE OF THE EIGHTEENTH CENTURY. German literature from the beginning of the century to the advent of Romanticism. Topics include: the rise and development of classicism, the masterpieces of Lessing, Goethe, and Schiller, the decline and disintegration of Classicism in the 18th century. Collateral readings. Prereq.: Ger. 6. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

55-56. GERMAN LITERATURE OF THE NINETEENTH CENTURY. The period from 1800 to the death of Nietzsche from four points of view: (a) rise and development of the Romantic School including the romantic opera, (b) the drama as reflected in the works of Kleist, Grillparzer, Hebbel, Hauptman, (c) the novel as an illustration of social and cultural conditions with emphasis on the humorists (Richter, Grabbe, Meyer, Keller, Busch), (d) the collapse of the idealistic systems of philosophy as reflected in the works of Schopenhauer, Nietzsche, and others. Prereq.: Ger. 6. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

57-58. TWENTIETH CENTURY GERMAN LITERATURE. Literature from 1900 to the present time, including the schools of Naturalism, Impressionism, Expressionism, and "Neue Sachlichkeit". Emphasis on the works of Kafka and of the Nobel-prize winners, Hauptmann, Spitteler, Thomas Mann, and Hesse. Readings and discussions will be supplemented by articles and commentaries from current German literary magazines. Prereq.: Ger. 6. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

* No student from a foreign country will be permitted to register for any language course numbered 1-2 or 3-4 (except Greek 1-2, 3-4) in such student's native language.

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Greek

Register for the following courses as Gr. 1, etc.

1-2. ELEMENTARY GREEK. Grammar, composition, translation. Mr. Walsh. Prereq.: Permission of the instructor. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

3-4. INTERMEDIATE GREEK. Translation of several books of Homer's *Iliad*; work in grammar and word derivation. Mr. Walsh. Prereq.: Gr. 2. 3 lec. or rec.; 3 cr. (Offered 1961-62.)

Italian

Register for the following as Ital. 1, etc.

*1-2. ELEMENTARY ITALIAN. Elements of Italian grammar, reading of simple prose, oral practice. Mr. Cryesky. 3 lec. or rec.; 3 cr. *This course cannot be counted for major credit.* (Not offered 1961-62.)

Latin

Register for the following courses as Lat. 1, etc.

New students will be assigned to Latin 1, Latin 3, or Latin 5 on the basis of their scores on the Latin reading examination.

1-2. ELEMENTARY LATIN. Elements of grammar, reading of simple prose. The changes in meaning and form of English and Romance language derivatives from Latin. 3 lec. or rec.; 3 cr. (*Students who offer two entrance units [two years of high-school work] in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.*) This course cannot be counted for major credit. (Not offered 1961-62.)

3-4. INTERMEDIATE LATIN. A review of Latin grammar and vocabulary, followed by readings in prose and poetry. Prereq.: Lat. 2 or the equivalent. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

5-6. LATIN PROSE AND POETRY. Selections from Livy, Catullus, Ovid, Phaedrus, Martial, and the odes of Horace. Translation, lectures, and study of the influence of Latin on English poetry. Mr. Walsh. Prereq.: Lat. 4 or equivalent. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

53-54. THE HISTORIANS. Livy, Suetonius, and Tacitus in selected works. Illustrated lectures and outside readings on the historical, social, and political background of Rome essential to the student or teacher of Latin. Prereq.: Lat. 6 or equivalent. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

55-56. THE GOLDEN AGE. Roman literature of the classical period, particularly the works of Caesar, Cicero, and Virgil. Prereq.: Lat. 6 or its equivalent. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

* See page 193 for explanation of footnote.

DESCRIPTION OF COURSES

Russian

Register for the following as Ru. 1, etc.

*1-2. **ELEMENTARY RUSSIAN.** Elements of Russian grammar, reading of graded prose, and oral use of the language. 3 lec. or rec.; 3 cr. (*Students who offer two entrance units [two years of high-school work] in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.*) This course cannot be counted for major credit.

3-4. **INTERMEDIATE RUSSIAN.** Designed to improve the student's ability to understand and speak Russian and to read and write in Russian scientific and cultural materials through class and outside work and language laboratory drills. Prereq.: Ru. 2 or equivalent. 3 rec.; 2 ½-hr. lab.; 3 cr.

Spanish

Register for the following courses as Sp. 1, etc.

New students will be assigned to Spanish 1, Spanish 2, Spanish 3, Spanish 4, or Spanish 5, on the basis of their scores on the Spanish reading examinations.

†1. **ELEMENTARY SPANISH.** Elements of Spanish for those students with no previous knowledge of the language. Aural-oral practice and the study of fundamental speech patterns to achieve a firm basis for an active command of the language and later the reading and writing of simple prose. The course content is integrated with Intermediate Spanish. No credit towards a major. 5 rec.; 2 hrs. lab.; 5 cr. (*Students who offer two entrance units in Spanish will not be permitted to register for credit, but may audit the course with proper authorization.*)

‡2. **INTERMEDIATE SPANISH.** A continuation of Spanish 1 with emphasis on more advanced speech patterns, vocabulary, idioms, and syntax. The course is devoted to audio-lingual adaptation, advanced reading, and writing and grammar structure review. 5 rec.; 2 hrs. lab.; 5 cr. No credit towards a major.

3, 4. **SPANISH CONVERSATION AND COMPOSITION.** Spoken and written Spanish with careful attention to pronunciation, intonation, use of idioms, and grammatical structure. Approximately two thirds of the class time will be given to conversation; the remaining part to drills of correct patterns and readings which will provide subject matter for oral work. 3 rec.; 2 ½-hr. lab.; 3 cr. (Spanish 4 not offered in 1961-62.)

5, 6. **SPANISH CIVILIZATION AND LITERATURE.** A clear and complete view of Spanish literature, distinguishing and classifying the principal directions of Spanish literature from its origins to the present. The interrelation of history and literature. Collateral readings. Mr. Leighton. Prereq.: Sp. 4. 3 lec. or rec.; 3 cr. Required of majors in Spanish.

* No student from a foreign country will be permitted to register for any language course numbered 1-2 or 3-4 (except Greek 1-2, 3-4) in such student's native language.

† The content of this course is equivalent to Elementary Spanish 1-2 under the former system.

‡ The content of this course is equivalent to Intermediate Spanish 3-4 under the former system.

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31, 32. **ADVANCED SPANISH CONVERSATION AND COMPOSITION.** For students who wish to perfect their command of written and spoken Spanish, maintain aural-oral fluency in Spanish through intensive work in and out of the classroom, individual conferences, and laboratory sessions. Mr. Casas. Prereq.; Span. 3 or 4 or equivalent. 3 lec.; 2 ½-hr. lab.; 3 cr. (Sp. 31 not offered in 1961-62.)

51. **SPANISH LITERATURE UP TO 1600 AND CERVANTES.** Readings and discussion of the great human creations of early Spanish literature such as *El Poema del Mio Cid*, *El Libro de Buen Amor*, *La Celestina* and *Don Quixote*, and their social and historical background. The first part covers early Spanish literature up to Cervantes. The second part is devoted entirely to Cervantes: his life, drama, *Novelas Ejemplares*, and his masterpiece *Don Quixote*. Prereq.: Sp. 5 or equivalent. 3 lec.; 3 cr. (Not offered 1961-62.)

52. **DRAMA AND POETRY OF THE SIGLO DE ORO.** The social background of the baroque period. Readings of the representative plays of Lope de Vega, Calderon, Alarcon, Tirso de Molina, and the poetry of Gongora and Quevedo. Development of the prose of the period. Prereq.: Sp. 5 or equivalent. 3 rec.; 3 cr. (Not offered 1961-62.)

55. **LITERATURE OF THE NINETEENTH CENTURY.** Preliminary survey of the eighteenth century and readings and discussion of the main literary movements and writers of the nineteenth century such as Quintana, Espronceda, Zorrilla, Larra, Duque de Rivas, Becquer, Perez Galdos, Valera, Pereda, Clarin, and Echegaray. Social and historical background of Spain in relation to nineteenth century thought in Europe. Mr. Casas. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr. (Offered 1961-62.)

56. **CONTEMPORARY SPANISH LITERATURE.** Starting with the generation of 1898 this course covers the readings and discussion of the work of such writers as Unamuno, Azorin, Baroja, Machado, J. R. Jimenez, Ortega y Gasset, Garcia Lorca, Perez de Ayala, Casona, Benavente, and a survey of Spanish literature and thought since 1939. Mr. Casas. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr. (Offered 1961-62.)

65, 66. **SPANISH-AMERICAN LITERATURE.** The main themes of Spanish-American literature through the reading of the works of the most representative authors along with an historical, social and geographical background of the New World. Mr. Casas. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr. (Not offered 1961-62.)

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LATIN

(See *Languages*)

LAW

(See *Other Programs of Study Page 80*)

DESCRIPTION OF COURSES

LIBERAL ARTS

The following courses are non-departmental courses open only to seniors in the College of Liberal Arts. Register for them as L. A. 51, etc.

51, (51). SENIOR SYNTHESIS: AMERICAN CIVILIZATION IN TRANSITION. To assist the student in integrating the knowledge and skills which he has acquired. The student is put into contact with a variety of ideas and methods which seem important to an understanding of our changing society. Lectures by experts in a variety of academic fields. The ideas, methods, and techniques of integration of these experts constitute the basic data for the course. Each Division of the College of Liberal Arts supplies guest speakers for the course. Mr. Menge, Mr. Jellison, and Mr. Bobick. *Prior to registration in L. A. 51, an interview with a member of the course staff is required.* Prereq.: Senior standing in the College of Liberal Arts. One two-hour lecture and discussion period with a guest speaker and two one-hour seminar periods. 3 cr.

97, (97). INDEPENDENT STUDY. See description of the plan on page 93. Not less than 6 cr. nor more than 12 cr. for the year.

MATHEMATICS

M. EVANS MUNROE, *Professor*; MARVIN R. SOLT, *Professor*; WILLIAM L. KICHLINE, *Professor*; RUTH M. PETERS, *Associate Professor*; SHEPLEY L. ROSS, *Associate Professor*; ROBERT H. OWENS, *Associate Professor*; EDWARD H. BATHO, *Associate Professor*; A. ROBB JACOBY, *Associate Professor*; DONALD M. PERKINS, *Assistant Professor*; ROBERT O. KIMBALL, *Assistant Professor*; FREDERICK J. ROBINSON, *Assistant Professor*; JOHN C. MAIRHUBER, *Assistant Professor*; DAVID M. BURTON, *Assistant Professor*; BARY G. WINGERSKY, *Instructor*

2, (2). INTERMEDIATE ALGEBRA. The elements of algebra. Intended primarily for students with only one entrance unit of algebra. Prereq.: One entrance unit of algebra. 3 rec.; 3 cr. Does not count for major credit in Mathematics. (Math. 2 is not available for credit in the College of Liberal Arts to those students who have had two units of high school algebra or the equivalent.)

3, (3). TRIGONOMETRY. The elements of trigonometry, logarithms. Prereq.: Math. 2 or 2 units of high school algebra and 1 unit of high school geometry. 3 rec.; 3 cr. Does not count for major credit in Mathematics. (Math. 3 is not available for credit in the College of Liberal Arts to those students who have had a half year of high school trigonometry or the equivalent.)

7-8. FUNDAMENTAL MATHEMATICS. Selected topics from number theory, algebra, trigonometry, geometries, statistics, logic, calculus, and topology. Intended for Liberal Arts students who desire an introduction to the concepts of modern mathematics. This is the prerequisite for Math. 9-10. Prereq.: At least 3 entrance units of mathematics which should include at least $1\frac{1}{2}$ years of algebra, 1 year of geometry, and $\frac{1}{2}$ year of trigonometry. 3 rec.; 3 cr. Does not count for major credit in Mathematics.

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9-10. DIFFERENTIAL AND INTEGRAL CALCULUS. Fundamentals of differential and integral calculus. Designed for Liberal Arts Mathematics majors. Prereq.: Math. 7-8. 3 rec.; 3 cr.

21. CALCULUS B1. The derivative and the integral for polynomial functions with applications; review of fractions, exponents, radicals, trigonometric identities, exponential and logarithmic functions; derivative and integral formulas for algebraic and transcendental functions. Entering Technology freshmen will be placed in the 21-22-23 sequence or in the 25-26 sequence on the basis of an achievement test in algebra and trigonometry. Prereq.: 2 years of algebra, 1 year of geometry, $\frac{1}{2}$ year of trigonometry. 3 lec.; 2 rec.; 5 cr.

22. CALCULUS B2. Limits and indeterminate forms; lines and conics; use of derivatives in curve sketching; polar coordinates; the modern theory of the differential; applications of integration. Prereq.: Math. 21. 3 lec.; 2 rec.; 5 cr.

23. CALCULUS B3. Integration by parts, by partial fractions, and by substitution; iterated integrals and applications; series. Prereq.: Math. 22. 3 lec.; 2 rec.; 5 cr.

24. DIFFERENTIAL EQUATIONS. Basic concepts, methods, and applications of ordinary differential equations; exact and approximate methods for solving first order equations; higher order linear equations; series solutions; systems of equations; boundary value problems. Prereq.: Math. 10 or 23 or 26. 3 rec.; 3 cr.

25. CALCULUS A1. The derivative and the integral for polynomial functions with applications; derivative and integral formulas for algebraic and transcendental functions; limits and indeterminate forms; lines and conics; use of derivatives in curve sketching; polar coordinates. Entering Technology freshmen will be placed in the 21-22-23 sequence or in the 25-26 sequence on the basis of an achievement test in algebra and trigonometry. Prereq.: 2 years of algebra, 1 year of geometry, $\frac{1}{2}$ year of trigonometry. 3 lec.; 2 rec.; 5 cr.

26. CALCULUS A2. The modern theory of the differential; applications of integration; integration by parts, by partial fractions and by substitution; iterated integrals and applications; series. Prereq.: Math. 25. 3 lec.; 2 rec.; 5 cr.

27. MULTI-DIMENSIONAL CALCULUS. Vectors, matrices and linear transformations, partial derivatives, maximum-minimum problems, implicit function theorem and applications, vector differential calculus, exterior products and multiple integrals, the generalized Stokes theorem and its classical specializations. Prereq.: Math. 23 or 26. 3 lec.; 2 rec.; 5 cr.

30. ASTRONOMY. A brief descriptive course. A study of the physical characteristics and motions of the members of the solar system and the sidereal universe. Illustrated lectures, recitations, and practice in the use of equatorial telescope. Mr. Solt. Prereq.: One year of college physical science. 3 rec.; 3 cr.

41. PROBABILITY. Discrete and continuous distributions; random variables; moments; normal and Poisson distributions; the central limit theorem; laws of large numbers. Prereq.: Math. 22 or 10. 3 rec.; 3 cr.

42. STATISTICS. Sample statistics; goodness of fit; estimation of parameters; testing of hypotheses; comparisons of the means and of the

DESCRIPTION OF COURSES

variance of two groups; correlation, fitting of curves by the method of least squares. Prereq.: Math. 41. 3 rec.; 3 cr.

51. **METHODS OF APPLIED MATHEMATICS I.** Solutions of ordinary differential equations by D-operators, Laplace Transforms, and by series; representation of functions by definite integrals (Gamma, Beta, and error functions); Bessel functions; Fourier Series. Prereq.: Math. 15 or 24. 3 rec.; 3 cr.

52. **METHODS OF APPLIED MATHEMATICS II.** Vector analysis (line, surface, and volume integrals); elementary variational techniques; development of some partial differential equations of mathematical physics; solutions of partial differential equations by Laplace transforms and by Green's functions. Prereq.: Math. 51 or 58. 3 rec.; 3 cr.

53-54. **METHODS AND TECHNIQUES OF MODERN COMPUTATION.** Methods of numerical analysis which are believed to be particularly suitable for high speed computation, including some newly developed methods. Methods for making analytical approximations will also be emphasized. An introduction to programming techniques, assembly and compiler programs, interpretive systems and symbolic operations. In the laboratory portion of the course, the practical aspects of modern computation, such as loss of precision, round-off error, overflow and underflow, etc., will be illustrated by means of short problems on both the desk calculator and the digital computer in the UNH Computation Center. A long range project for investigation on the computer will be assigned. Prereq.: Math. 15 or 24. 2 rec.; 2 lab.; 4 cr.

55. **FUNDAMENTAL CONCEPTS OF GEOMETRY.** Systems of postulates of various geometries; geometric invariants; synthetic and analytic projective geometry; introduction to non-Euclidean geometry, topology, and the elementary differential geometry of curves and surfaces. Prereq.: Math. 15 or 23. (Math. 15 may be taken concurrently.) 4 rec.; 4 cr.

56. **TOPICS IN NUMBER THEORY.** Elementary properties of integers; the Euclidean algorithm; divisibility; diophantine equations of the first degree; congruences; residue classes and the Euler function; distribution of primes; quadratic residues; diophantine equations of the second degree; selected topics in diophantine approximation and number-theoretic functions. Prereq.: Math. 10 or 23. 3 rec.; 4 cr.

58. **FOURIER SERIES AND BOUNDARY VALUE PROBLEMS.** Series solution of differential equations; the Hypergeometric equation; representation of functions by orthogonal series and in particular, by trigonometrical series; application of the theory of Laplace and Fourier transforms to the solution of boundary value problems; the partial differential equations of mathematical physics. Prereq.: Math. 15 or 24. 4 rec.; 4 cr.

61-62. **HIGHER ALGEBRA I, II.** The integers, the rational, real and complex number systems, congruences, theory of polynomial equations, theory of groups, vector spaces and transformations, matrices and determinants, rings, integral domains, fields, ideal theory, lattices, and Boolean algebras. Prereq.: Math. 10 or 23. 4 rec.; 4 cr.

67. **REAL ANALYSIS I.** The real number system; elements of set theory; theory of limits; continuous functions and their properties; differentiability and the mean value theorem. Prereq.: Math. 10 or 23. 4 rec.; 4 cr.

68. **REAL ANALYSIS II.** The Riemann integral; uniform convergence; double and iterated limits; applications of double limit theorem to series,

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limits under the integral sign, and existence theorems for differential equations. Prereq.: Math. 67. 4 rec.; 4 cr.

71-72. FOUNDATIONS OF THE NUMBER SYSTEM. Postulates and mathematical structures. A study of various mathematical systems designed to show the nature and significance of the fundamental principles of arithmetic. Intended primarily for elementary school teachers. Prereq.: Consent of instructor. 3 rec.; 3 cr.

81. THEORY OF APPROXIMATION. The theorems of Weierstrass on approximation of continuous functions; the Tschebycheff approximation problem; Tschebycheff polynomials; trigonometric polynomials of best approximation; interpolation; the formulas of Lagrange and Newton; trigonometric interpolation. Prereq.: Math. 15 or 24. 3 rec.; 4 cr.

82. NON-LINEAR DIFFERENTIAL EQUATIONS. Phase plane analysis of lineal systems and non-linear conservative systems; stability theorems; limit cycles and periodic solutions; the Van der Pol equation; the method of Kryloff and Bogoliouboff. Prereq.: Math. 15 or 24. 3 rec.; 4 cr.

83. INTRODUCTION TO DIFFERENTIAL GEOMETRY. A first course in the metric differential Geometry of curves and surfaces in Euclidean space. Prereq.: Math. 15 or 24. 3 rec.; 4 cr.

84. INTRODUCTION TO TOPOLOGY. Elementary point-set topology in metric and topological spaces, in particular the real line and plane. Prereq.: Math. 68. 4 rec.; 4 cr.

88. COMPLEX ANALYSIS. The complex number system; analyticity; elementary functions; Cauchy integral theorem and formulas; Taylor and Laurent series; singularities and residues; conformal mapping. Prereq.: Math. 15 or 24. 4 rec.; 4 cr.

91. MATHEMATICS-EDUCATION (MATH-ED.) The aims and values of secondary-school mathematics; the recommendations of the national committee on mathematics requirements, and the State Board requirements; the subject matter and the sequence in which it should be presented in both junior and senior high schools; techniques and instructional aids used in teaching secondary-school mathematics; errors, testing program, remedial teaching. Students preparing to teach mathematics in high school should register for this course—it is a prerequisite for Supervised Teaching in Mathematics. Lectures, assigned readings, and discussions. Prereq.: Education 58 and Math. 10 or 22. 3 rec.; 3 cr. May be counted as major credit only by students preparing to teach mathematics in the secondary schools.

96. INTRODUCTION TO THEORY OF DIFFERENTIAL EQUATIONS. Existence and uniqueness theorems for ordinary differential equations; theory of linear ordinary differential equations of order n ; oscillation and comparison theorems for second order linear ordinary differential equations; first order partial differential equations; linear partial differential equations of the second order. Prereq.: Math. 68. 3 rec.; 4 cr.

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DESCRIPTION OF COURSES

MECHANICAL ENGINEERING

EDWARD T. DONOVAN, *Professor*; E. HOWARD STOLWORTHY, *Professor*; TENHO S. KAUPPINEN, *Associate Professor*; RUSSELL L. VALENTINE, *Associate Professor*; E. EUGENE ALLMENDINGER, *Associate Professor*; WILLIAM E. CLARK, *Assistant Professor*; KARL S. WEBSTER, *Assistant Professor*; WILLIAM MOSBERG, *Assistant Professor*; FREDERICK G. HOCHGRAF, *Assistant Professor*; ELIAS M. O'CONNELL, *Instructor*; HARVARD B. EMERY, *Instructor*; JOHN A. WILSON, *Instructor*; LYMAN J. BATCHELDER, *Instructor Emeritus*; JOHN C. TONKIN, *Instructor Emeritus*

13-14. **ENGINEERING DRAWING.** Representation of engineering information by multiview drawings, pictorial views, sketches, and graphs. The fundamentals of descriptive geometry. Mr. Kauppinen. Mr. O'Connell, and Mr. Emery. 1 lab.; 1 cr.

17. **MANUFACTURING PROCESSES AND DESIGN.** A study of the machines and processes that are used in manufacturing and an analysis of the effect of these processes on the design of manufactured parts. Mr. Clark and Mr. O'Connell. Prereq.: M.E. 14. 3 lab.; 3 cr.

22, (22). **MATERIALS I.** An introduction to the structure and properties of metals, plastics, and ceramics with a special emphasis on the influence of atomic structure on physical properties. Solidification, equilibrium multiphase relations, deformation models, elastic energy as a driving force. Introductory laboratory work in X-ray metallography, optical metallography, spectroscopy, dilatometry, changes in mechanical properties due to deformation. Mr. Hochgraf. 3 lab.; 3 cr.

25. **STATICS.** Analytical and graphical methods of determining forces in rigid bodies in equilibrium; properties of areas and bodies. Mr. Kauppinen, Mr. Allmendinger, Mr. Clark, Mr. Wilson, and Mr. Webster. Prereq.: Math. 22, Phys. 18. 2 rec.; 2 cr.

26. **DYNAMICS.** Kinematics, kinetics, and introduction to vibrations of mechanical systems. Mr. Kauppinen, Mr. Allmendinger, Mr. Clark, Mr. Wilson, and Mr. Webster. Prereq.: M.E. 25. Prereq. or concurrent: Math. 24. 3 rec.; 3 cr.

32, (32). **MACHINE SHOP PRACTICE.** Advanced work in machine tools and their use, production methods, inspection, and control. Mr. Clark. Prereq.: M.E. 17-18. 2 lab.; 2 cr.

33, (33). **THERMODYNAMICS.** The fundamental laws of thermodynamics and their relation to working substances. Prereq. or concurrent: Phys. 24. 3 rec.; 3 cr.

34, (34). **THERMODYNAMICS.** A more comprehensive study of thermodynamic properties of media; fundamentals of combustion; heat transfer. Prereq.: M.E. 33. 3 rec.; 3 cr.

35, (35). **STRENGTH OF MATERIALS.** Stress and strains in structural and machine elements. Prereq.: M.E. 25. 3 rec.; 3 cr.

36. **FLUID DYNAMICS.** Fundamentals and phenomena of compressible and incompressible fluid flow and its relation to thermodynamics, including fluid properties, energy transfer and momentum principles. Specifically considered are adiabatic flow with and without friction, diabatic flow, dimensional analysis and flow measurement. Prereq.: M.E. 26, 33. 3 rec.; 3 cr.

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37. **MECHANICAL LABORATORY.** Study and instrumentation of mechanical engineering equipment. Prereq. or concurrent: M.E. 33. 1 lab.; 1 cr.

38. **MECHANICAL LABORATORY.** Investigation of the operating characteristics of mechanical equipment and heat exchangers; preparation of engineering reports. Prereq.: M.E. 37. Prereq. or concurrent: M.E. 34, 36. 2 lab.; 2 cr.

40. **HEATING AND AIR CONDITIONING.** Present methods of heating and air conditioning buildings. Mr. Stolworthy and Mr. Mosberg. Prereq.: Hotel Ad. 26. 2 rec.; 1 lab.; 3 cr.

41-42. **MECHANICAL ENGINEERING SEMINAR.** Student reports and discussions of recent developments in mechanical engineering. Prereq.: Senior standing. 1 rec.; 1 cr.

43-44. **MACHINE DESIGN AND ANALYSIS.** Analysis and design of mechanical elements and systems, utilizing and developing further the fundamentals of strength of materials and dynamics. Prereq.: M.E. 26, 35, Math. 24. 3 rec.; 3 cr.

49. **THESIS.** An investigation or research of some mechanical engineering problem. Elective for seniors in Mechanical Engineering. Prereq.: Permission of the Department. 2 cr.

53. **POWER PLANTS.** A study of the steam generating plant dealing with its equipment and costs. Mr. Donovan and Mr. Stolworthy. Prereq.: M.E. 24. 3 rec.; 3 cr.

54. **POWER PLANTS.** Heat transmission theory. Heat transmission problems on power plant equipment and mechanical equipment. Mr. Donovan and Mr. Stolworthy. Prereq.: M.E. 24. 3 rec.; 3 cr.

55. **INTERNAL COMBUSTION ENGINES.** Thermodynamics applied to spark ignition and compression ignition engines. Fuels, carburetion, fuel injection, lubrication, performance. Mr. Stolworthy. Prereq.: M.E. 23. 2 rec.; 1 lab.; 3 cr.

56. **INTERNAL COMBUSTION ENGINES.** Thermodynamics applied to gas turbines and propulsion motors. Fuels, combustion, and performance. Mr. Stolworthy. Prereq.: M.E. 23. 2 rec.; 1 lab.; 3 cr.

57-58. **HEAT AND POWER SYSTEMS.** Analysis and solution of heat and power system problems, utilizing and developing further the fundamentals of thermodynamics, fluid flow, combustion, and heat transfer. Prereq.: M.E. 34, 36, and 38. 3 rec.; 1 lab.; 4 cr.

63. **MATERIALS II.** Behavior of metals, plastics, and ceramics in engineering environments. Non-equilibrium multiphase relations, diffusion, nucleation of phases, dislocation models of creep and relaxation, ductile and brittle modes of failure, thermal stresses, modification of bulk and surface properties through deformation and heat treating. Laboratory work includes observation of properties by classical mechanical methods. Mr. Hochgraf. Prereq.: M.E. 22. 3 lab.; 3 cr.

65. **ENGINEERING ECONOMY.** The principles which form the basis of engineering procedures for obtaining the highest ratio of utility to cost. Mr. Donovan. Prereq.: Senior standing. 3 rec.; 3 cr.

66. **INDUSTRIAL MANAGEMENT.** Principles and methods of industrial management, designed to give students a working knowledge of modern industrial practice, with particular emphasis on the engineering viewpoint. Prereq.: Senior standing. Mr. Donovan. 3 rec.; 3 cr.

DESCRIPTION OF COURSES

67. X-RAY METALLOGRAPHY. Theoretical and experimental studies of X-ray diffraction and micro-radiography. Production of x-rays; directions and intensities of diffracted beams; Laue and Debye-Scherrer photographs; size, perfection, and orientation of grains; phase diagram determinations; stress measurement. Mr. Hochgraf. Prereq.: M.E. 22 or permission of instructor. 3 lab.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

MUSIC

KARL H. BRATTON, *Professor*; ROBERT W. MANTON, *Professor*; DONALD E. STEELE, *Professor*; JOHN B. WHITLOCK, *Associate Professor*; IRVING D. BARTLEY, *Assistant Professor*; LUCA DiCECCO, *Assistant Professor*; ALLEN OWEN, *Assistant Professor*; HOWARD BOYAJIAN, *Assistant Professor*; JOHN W. WICKS, *Assistant Professor*; JOHN J. ZEI, *Instructor*

Music Organizations

Registration for musical organization courses should be completed during the registration period. These courses cannot be used to satisfy major requirements except in the Music-Education Curriculum. *Each participant must be registered for either credit or audit.*

1, (1). UNIVERSITY BAND. Open to all students on basis of individual tryouts. The band gives concerts during the college year, and also furnishes music for football games. Students enrolling for concert band work only will be expected to begin their work at the close of the football season. Mr. Owen. Prereq.: Permission of instructor. 2 lab.; $\frac{1}{2}$ cr.

2, (2). UNIVERSITY SYMPHONY ORCHESTRA. Open to all students and others on basis of individual tryouts. The orchestra gives several concerts during the year and also accompanies the vocal groups and solo instrumentalists on various occasions. Membership includes students, faculty, and members of the surrounding communities. Mr. Boyajian. Prereq.: Permission of instructor. 2 lab.; $\frac{1}{2}$ cr.

3W, (3W). WOMEN'S GLEE CLUB. Open to all students interested in singing who fulfill the requirements of a tryout. Recommended for all women voice majors. Mr. Zei. Prereq.: Permission of the instructor. 2 lab.; $\frac{1}{2}$ cr.

3M, (3M). MEN'S GLEE CLUB. Open to all students interested in singing who fulfill the requirements of a tryout. Recommended for all men voice majors. Mr. Zei. Prereq.: Permission of the instructor. 2 lab.; $\frac{1}{2}$ cr.

5, (5). UNIVERSITY CONCERT CHOIR. An advanced choral group devoted to study and performance of the best classical and modern choral literature. Recommended for men and women voice majors. Mr. Bratton. Prereq.: Permission of instructor. 2 lab.; $\frac{1}{2}$ cr.

6, (6). R.O.T.C. BAND. Open only to freshmen and sophomore men enrolled in the R.O.T.C. program on basis of individual tryouts. This band furnishes music for all military functions, and other University activities when needed. Mr. Owen. Prereq.: Permission of instructor. 2 lab.; $\frac{1}{2}$ cr.

7, (7). ENSEMBLE. v) Vocal; s) String; ts) Tudor Singers; b) Brass; ww) Woodwind. Small groups of instrumentalists and vocalists organized

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to provide advanced students experience in such groups. Prereq.: Permission of the instructor. 2 lab.; $\frac{1}{2}$ cr.

8, (8). **STRING ORCHESTRA.** Open to all students on basis of individual tryouts. This group appears at all the University Symphony Orchestra concerts. 1 rec.: $\frac{1}{2}$ cr. (Not offered 1961-62.)

Music majors may count a maximum of 8 credits earned in music organizations toward graduation. Students earning credit in R.O.T.C. Band may count a maximum of 6 credit toward graduation including band credit. Any other student may count not more than 4 credits toward graduation.

Applied Music

Register for the following courses as Mus. 23, etc.

Lessons in Applied Music are based on $\frac{1}{2}$ -hour private instruction per week. One semester hour of credit may be earned with one lesson per week; two semester hours of credit may be earned with two lessons per week. Five one-hour practice periods per credit will be sought out by the music students themselves. The special semester fee for Applied Music is \$25 for one lesson a week, and \$50 for two lessons a week. These fees include the use of a practice room for the required preparations.

Majors in Applied Music are required to present 16 semester hours in Applied Music taken over a period of four years. Two lessons per week are required each semester. Four semester credits taken in the freshman year are regarded as prerequisite to the Applied Music option.

Registration in Applied Music courses is open to all students in the University, subject to approval by the instructor. A student may register for credit in the same course in successive semesters.

19, 20. **VOICE CLASS FOR BEGINNERS.** To develop the basic fundamentals in voice culture, such as breathing, phrasing, diction, pure tone, resonance, posture, and study of vocal solo literature through group activity with some of the finest works of the masters. Permission of the instructor. Mr. Zei. 2 rec.; 2 cr.

21, 22. **FUNCTIONAL PIANO CLASS.** Piano instruction primarily for beginning students in a class. Training in the following subjects will constitute the course: pianoforte techniques and reading of music; keyboard harmony geared to the practical harmonization of grade school melodies; transposition; sight reading; improvisation. Especially for students interested in the Music Education Curriculum. Mr. DiCecco. Enrollment limited to 8. Permission of instructor. 2 rec.; 2 cr.

†23, (23). **PIANO.** The methods of presentation and the material used vary with each pupil and his degree of advancement. With beginners, training is given in the fundamentals of pianoforte technique and in the reading of keyboard music. As early as is practicable, emphasis is placed on musical values, musicianship, and sound piano technique. For this purpose, the literature employed is selected from the masters. Musical understanding is developed and quality of performance is stressed. With the attainment

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DESCRIPTION OF COURSES

of advanced technique, the student's repertory is broadened to include works of all periods of literature: pre-Bach, J. S. Bach, C. P. E. Bach, Scarlatti, Haydn, Mozart, Beethoven, the romantic composers, the post-romantic, and present-day composers. Mr. Manton, Mr. Steele, Mr. Bartley, Mr. Wicks, Mr. Boyajian, and Mr. DiCecco. 1 or 2 lessons; 1 or 2 cr.

†24, (24). ORGAN. A thorough foundation in pedal and manual technique, including hymn playing, followed in subsequent semesters by the standard works of Bach, Cesar Franck, Widor, and contemporary composers. Students should be proficient in piano before enrolling for organ. Permission of the instructor is required. Mr. Bartley and Mr. Wicks. 1 or 2 lessons; 1 or 2 cr.

†25, (25). VIOLIN, VIOLA. The choice of literature and method in violin teaching depends entirely on the individual pupil's background and ability, therefore no single course of study is set up as a requirement for all pupils. Emphasis is placed primarily on musicianship and musical values, and the development of a sound, reliable technique is a means to that end. Technique is developed in these lessons not so much through exercise and drill as it is through the best in literature. Mr. Boyajian. 1 or 2 lessons; 1 or 2 cr.

†26, (26). VOICE. Instruction in voice will seek to develop those qualities which are essential for intelligent interrelations, such as correct posture, breathing, pure tone, resonance, clear enunciation, and technical facility. Each voice is given the treatment best suited to its individual needs. A higher ideal than the perfection of mere mechanical skill is sought, namely a musicianly style of singing and a thorough appreciation of the best works of the masters, both classic and modern. Mr. Bratton and Mr. Zei. 1 or 2 lessons; 1 or 2 cr.

27, (27). VIOLONCELLO, STRING BASS. Objectives are based primarily on the student's ability and experience. A general awareness of the instrument as regards technique and tone are the first essential prerequisites. These elements will gradually broaden to include the attention and cultivation of the student's musical perception and repertoire. Mr. DiCecco. 1 or 2 lessons; 1 or 2 cr.

†28, (28). WOODWIND. The technique and literature of clarinet, flute, oboe, bassoon, and saxophone, or any woodwind instrument. Mr. Owen and Mr. Whitlock. 1 or 2 lessons; 1 or 2 cr.

†29, (29). BRASS. Instruction in any of the following instruments: trumpet, trombone, French horn, baritone, and tuba, or any brass instrument. Correct tone production, articulation, and musical interpretation are stressed. Mr. Whitlock and Mr. Owen. 1 or 2 lessons; 1 or 2 cr.

†30, (30). PERCUSSION. Snare drum rudiments. The technique, tuning and sticking of the pedal and hand timpani. Cymbals and all other percussion effects (claves, maracas, triangle, tambourine, wood-block, chimes, etc.). Glockenspiel, bells, or bell lyre, as well as xylophone. Mr. Whitlock. 1 or 2 lessons; 1 or 2 cr.

117, 118. APPLIED MUSIC FOR GRADUATE CREDIT. a) Piano; b) Organ; c) Stringed Instruments; d) Voice; e) Woodwind; f) Brass; g) Percussion. Further development of technique, music interpretation, performance, and

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emphasis oriented toward the functional use of the instrument in the schoolroom. Prereq.: Must exhibit sufficient proficiency to warrant graduate study. Permission of the Chairman of the Department and the student's graduate supervisor. Audition required. A student may register for credit in the same courses in successive years with the approval of his major professor. Mr. Bratton and staff. 1-2 cr.

Theory and Composition

*†9-10. SIGHTSINGING, EAR TRAINING, DICTATION I. Intensive training in the acquisition of the basic essentials of music. Development of rhythmical sense, the identification and singing of intervals, accurate response to melodic, harmonic, and rhythmical dictation, the basic laws of musical notation, knowledge of scales, and terminology. Mr. DiCecco. 3 labs.; 0 cr.

†11-12. HARMONY I. Basic techniques in harmonization in four parts of basses (figured and unfigured) and soprano melodies using triads and their inversions, nonharmonic tones, the dominant seventh and its inversions, and secondary dominants. Attention will also be given to harmonic rhythm and modulation. Harmonic analysis of Bach chorales will be an integral part of this course. Keyboard harmony will also be stressed. Mr. Wicks. Prereq.: Music 9-10. However, if the student has sufficient familiarity with the keyboard to be able to read simple pianoforte music, he should take Music 11-12 in his freshman year along with Music 9-10. In this case, permission of the instructor is required. 3 rec.; 2 cr.

†13-14. SIGHTSINGING, EAR TRAINING, DICTATION II. An extension of Music 9-10. Further training in basic elements of music. The rhythmical and melodic phenomena of the art, development of acuity and accuracy in perception and response. Mr. DiCecco. Prereq.: Mus. 9-10. 3 lab.; 1 cr.

15-16. HARMONY II. Continuation of harmonization techniques developed in HARMONY I. The use of irregular resolutions; the diminished 7th; the incomplete major 9th; the complete dominant 9th; the sequence; the nondominant 7th, 9th, 11th, and 13th; the raised supertonic and submediant; the Neapolitan sixth; the four augmented 6th chords; and other chromatically altered chords. Formal and harmonic analysis of preludes in the Well-Tempered Clavier and works of the Classical and Romantic periods. Continued emphasis on keyboard harmony. Mr. Wicks. Prereq.: Mus. 11-12. 3 rec.; 2 cr.

†41-42. CONDUCTING METHODS — INSTRUMENTAL AND CHORAL. The development of conducting — physical aspects, equipment of conductor, fundamental gestures and beats, baton techniques. The reading and analysis of full and condensed scores. Essential choral and instrumental conducting techniques, problems of choral organization, psychology of rehearsal. Mr. Boyajian. 2 rec.; 1 cr.

* Mus. 9-10 is normally prerequisite to Mus. 11-12, but the two may be taken simultaneously with the approval of the instructor in Mus. 11-12. Qualified students are exempted from Mus. 9-10 when proper notification is furnished the College Dean's Office and the University Registrar.

† Students majoring in Music or enrolled in the Music-Education Curriculum are required to attend all student and faculty recitals as a part of the assigned work of their program.

DESCRIPTION OF COURSES

†53-54. **COUNTERPOINT.** First semester: Sixteenth century polyphony based on the sacred choral style of Palestrina, Vittoria, Lassus, and others of this period. Second semester: free instrumental counterpoint based on the styles of Bach, Handel, and other classic masters. Twentieth century counterpoint will be discussed in the closing classes of the course. Mr. Manton. Prereq.: Mus. 15-16 or permission of instructor. 2 rec.; 2 cr.

†59-60. **CANON AND FUGUE.** Free counterpoint in three and four parts, double counterpoint, the writing of simple two-part inventions, choral preludes, etc. The canonic and fugal studies will be based largely upon the works of Bach and will have as their objective the composition of a two-, a three-, and a four-voiced fugue. Mr. Manton. Prereq.: Mus. 53-54 or permission of instructor. 2 rec.; 2 cr.

†71-72. **COMPOSITION.** The various smaller harmonic forms, the variation, the rondo, and the sonata forms will serve as models for composition. Mr. Manton. Prereq.: Permission of the instructor. 2 rec.; 2 cr.

†97-98. **ORCHESTRATION.** Instruments and methods of combining them into coherent arrangements arriving at successful balances for the band and orchestral arranger. The characteristics, range, and tone quality of the instruments are fully covered and transcriptions are made. Orchestral effects are studied. Chorestration is offered during the latter part of the second semester. The techniques of writing for solo voices, for mixed voices, men's and women's voices, are taken up through the medium of arrangements, and original work. Mr. Manton. Prereq.: Permission of the instructor. 2 rec.; 2 cr.

History, Literature, and Appreciation

35. **MUSIC APPRECIATION.** Intelligent listening through formal analysis of the irreducible minimum of great musical masterpieces. A selection of the most important works of Beethoven, Schubert, Mendelssohn, Chopin, Liszt, Brahms, Franck, Tchaikowsky, d'Indy, and many others analyzed by the students and the instructor and played several times in the classroom. 2 cr. (Special Summer Session course; not offered in 1961.)

36. **MUSIC APPRECIATION.** Continuation of Music 35. Masterpieces drawn from the works of Palestrina, Bach, Handel, Haydn, and Mozart. Selections will be analyzed by the students and the instructor and played several times in the classroom. Supplementary assigned recordings at the University Library. 2 cr. (Special Summer Session course; not offered in 1961.)

†37-38. **INTRODUCTION TO MUSIC LITERATURE.** A listener's approach to music history. The evolution of ideas in sound, texture, and structure from the Middle Ages to the present, with special attention to the music of des Pres, Palestrina, Vittoria, Byrd, Purcell, Monteverdi, Bach, Handel, Haydn, Mozart, Beethoven, Schubert, and Brahms, together with many others. Emphasis is on the listener's acquiring a discerning ear as well as a broad historical perspective of the music of our Western civilization. Mr. Wicks and Mr. DiCecco. 3 rec.; 3 cr.

40. **SUMMER SESSION CHORUS AND BASIC CONDUCTING.** A choral group devoted to the study and performance of the best classical and modern

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choral literature. The basic elements of choral conducting, for elementary and secondary teachers, church choir directors, and those interested in singing. May be taken for credit or as recreation. Mr. Bratton. 1 cr. (Special Summer Session course; offered in 1961.)

†43. SURVEY OF MUSIC IN AMERICA. The development of music in the United States from Colonial times to the present. The various influences, such as the English tradition, the German era, the French impressionistic influence, and finally the quest for an American style with the music of the most representative composers. Mr. Manton. 2 rec.; 2 cr. (Alternate years; offered 1961-62.)

†47, 48. SURVEY OF PIANOFORTE LITERATURE. The history and development of keyboard literature from Bach to the present. A discussion and performance of the works of Bach, the sonatas and concertos of Haydn, Mozart, Beethoven, Schubert, the Romantic composers, and of contemporary writers. Mr. Steele. 2 rec.; 2 cr. (Alternate years; not offered 1961-62.)

†61. GREGORIAN CHANT TO PALESTRINA. The literature of music from the Middle Ages to about 1600, with emphasis upon the vocal, choral, and instrumental forms of the sixteenth century. The works of des Pres, Gombert, Palestrina, Lassus, Byrd, Gibbons, and others. Mr. Wicks. 2 rec.; 2 cr. (Alternate years; not offered 1961-62.)

†62. MONTEVERDI TO MOZART. The rise of opera and other Baroque forms. Culmination of the Baroque in Bach and Handel. Origin of the symphony and its growth under the influence of Haydn. Representative works of Haydn and Mozart. Each work is analyzed and performed in class. Mr. Wicks. 2 rec.; 2 cr. (Alternate years; not offered 1961-62.)

†63. ROMANTIC MUSIC OF THE NINETEENTH CENTURY. The sonata form as a basis for the symphonies, concerti, chamber music, and keyboard works of Beethoven, Berlioz, Schubert, Mendelssohn, Schumann, Brahms, Franck, Chopin, and Liszt. Romantic elements contained in the development of harmony orchestration, sonority, expressive content. The rise of the short piano piece, the German art song, the symphonic poem, nationalism in music. Mr. Steele. 2 rec.; 2 cr. (Alternate years; offered 1961-62.)

†64. TWENTIETH CENTURY MUSIC. Music of the twentieth century, including its literature, its trends, and an analysis of techniques, styles, forms, and expression. Mr. Steele. 2 rec.; 2 cr. (Alternate years; offered 1961-62.)

†(83). THE LIFE AND WORKS OF BEETHOVEN. The piano sonatas, symphonic works, and the string quartets. Lectures, analysis, reports, required readings, and listening. Mr. Manton. 2 rec.; 2 cr.

†87, 88. SURVEY OF OPERA AND ORATORIO. The oratorio and the opera beginning in Italy in the sixteenth century, culminating in modern opera and oratorio. This includes comic, grand, and romantic opera, and composers such as Handel, Mozart, Verdi, Puccini, Wagner, and Richard Strauss. The development of the recitative and aria styles and trends. Oratorio is stressed in the first semester; opera in the second. Mr. Zei. 2 rec.; 2 cr.

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DESCRIPTION OF COURSES

Music Education

The Department of Music offers a four-year curriculum for teachers of elementary and secondary school music. (See Music-Education curriculum.)

Register for the following courses as Mu-Ed. 90, etc.

55. CHORAL METHODS AND REPERTOIRE FOR THE ELEMENTARY AND HIGH SCHOOL TEACHER. A lecture-workshop course touching upon some of the problems and solutions in the organization and performance of elementary and high school glee clubs and community choirs. Emphasis is placed on techniques of rehearsal, repertory and suitable materials. Mr. Bratton. Prereq.: Permission of the instructor. 2 cr. (Special Summer Session course; offered 1961.)

57. ESSENTIALS OF MUSIC FOR THE CLASSROOM TEACHER. A course designed to provide training in the elements and appreciation of music for application to the grade-school classroom situation. Emphasis will be placed on melodic and rhythmical accuracy, basic keyboard harmony, elementary conducting, music literature. Recommended for the grade-school teacher. No performing ability required. Mr. Steele. Prereq.: Permission of the instructor. 2 cr. (Special Summer Session course; offered in 1961.)

90. PROBLEMS IN THE TEACHING OF ELEMENTARY SCHOOL MUSIC. Aims, scope, and organization of materials and activities in the elementary schools in keeping with modern trends in educational philosophy. The child voice, its care and development. A demonstration of materials and methods for the various grades. Observations of elementary school music. Mr. Whitlock. Prereq.: Educ. 58. 3 rec.; 1 lab.; 3 cr.

†93. PROBLEMS IN THE TEACHING OF SECONDARY SCHOOL MUSIC. The application of educational principles to the teaching and learning of music, and the organization of the music curriculum on the junior and senior high-school levels. The adolescent voice and the classification of voices; the selection of vocal and instrumental materials to fit the needs of the individual group, in order to insure the maximum growth and musical development of the students; and the building of unified concert programs. Problems of administration and management, and the relationship of the teacher to school and community. Observation of music programs in secondary schools. Mr. Whitlock. Prereq.: Educ. 58. 3 rec.; 1 lab.; 3 cr.

†94. ORGANIZATION AND ADMINISTRATION OF SCHOOL MUSIC GROUPS. Problems of organizing and administering school orchestras, bands, glee clubs, choruses and small ensembles, such as objectives, motivation, schedule, discipline, equipment, programs, finances, rehearsal techniques, contests and festivals, materials, personnel selection and grades. Mr. Whitlock. 3 cr. (Special Summer Session course; offered in 1961.)

†95. TECHNIQUES AND METHODS IN STRINGED INSTRUMENTS. Class-teaching of stringed instruments simulating classroom situations and methods. Mr. Boyajian. 2 rec.; 2 cr.

†(96). TECHNIQUES AND METHODS IN WOODWIND INSTRUMENTS. Correct tone production and technique of woodwind instruments. Materials and pro-

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cedures for class and individual instruction. The school band as a concert organization. Mr. Owen. 2 rec.; 2 cr. (*This is a first semester course.*)

†97. **TECHNIQUES AND METHODS IN BRASS AND PÉRCUSSION INSTRUMENTS.** Correct tone production and technique of brass instruments and of rudimentary percussion technique. Materials and procedures for class instruction. Mr. Whitlock. 2 rec.; 2 cr.

†98. **MUSIC FOR THE ELEMENTARY CLASSROOM TEACHER.** For the non-music specialist interested in utilizing music as a means of enriching children's lives. The correlation and integration of music in the school curriculum and the basic skills and techniques necessary. Also open to music specialists and school administrators. Mr. Whitlock. 3 cr. (Summer Session course.)

Education-Music (Ed-Mu) 93, 94. Supervised teaching in elementary and secondary school music. Prereq.: Mu-Ed 90, 93. (See page 167.)

NURSING

(*See Nursing Curriculum*)

OCCUPATIONAL THERAPY

(*See The Arts*)

These courses are for students in the Occupational Therapy curriculum; elective for others by permission of the Department Chairman.

Register for the following courses as O.T. 1, etc.

1. **CRAFTS.** Instruction in bookbinding, stenciling, silk screening, sewing, embroidery, knitting and crocheting, emphasizing the therapeutic application of these modalities. Miss Bell. 2 lab.; 2 cr.

2. **CRAFTS.** Seat weaving, basketry, chip carving, fly tying, and leatherwork. The therapeutic application of these crafts is stressed. Miss Bell. 3 lab.; 3 cr.

(5). **JEWELRY AND METALWORK.** Instruction in design and construction, using copper, silver, and pewter. Etching, tooling, casting, enameling and stone setting. Miss Clark. 3 lab.; 3 cr.

(6). **WEAVING.** Card weaving, small frame weaving, and hand and foot-powered loom weaving applied to occupational therapy. Miss Bell. 3 lab.; 3 cr.

7-8. **ELEMENTARY PROCESSES IN WOOD AND PLASTICS.** The design and construction of wood and plastic objects, including the nature and properties of these materials and the processes of cutting, shaping, fitting, and finishing. Practice and demonstrations cover the operation of hand and power tools, safety precautions, the making of adaptive equipment, and other problems of shop management to be encountered in occupational therapy. Mr. Valenza and Miss Bell. 1 rec.; 2 lab.; 2 cr.

(10). **LETTERING AND PRINTING.** Instruction in various styles of lettering with pen, and with brush; poster design; operation of hand and pedal manipulated presses, with elementary layout, composition with type, and

DESCRIPTION OF COURSES

proofreading. Survey and history of lettering and print methods. Miss Bell. 1 rec.; 2 lab.; 2 cr.

15-16. CERAMICS AND MODELING. Design and construction. Methods of preparing and working clay, and uses of pottery equipment best suited to application in occupational therapy work. Mr. Potter. 1 rec.; 2 lab.; 2 cr.

41. THEORY OF OCCUPATIONAL THERAPY. Occupational therapy as a profession. The theory in the use of recreation and library with handicapped individuals. Instruction trips to hospitals and treatment centers. 2 lec. or rec.; 2 cr.

42. THEORY OF OCCUPATIONAL THERAPY. Application of the principles of occupational therapy to general medical and surgical conditions, cardiac conditions, sensory disturbances and tuberculosis. Special problems encountered with pediatric and geriatric patients. Instruction trips to hospitals and treatment centers. Prereq.: O.T. 41, Psych. 37, (O.T. 49 to be taken concurrently.) 2 lec. or rec.; 2 cr.

(44). THEORY OF OCCUPATIONAL THERAPY. Application of the principles of occupational therapy to psychiatric conditions; the organization and administration of a hospital and an occupational therapy department. Instruction trips to hospitals and treatment centers. Prereq.: O.T. 41 and Psych. 54. (O.T. 50 to be taken concurrently.) 2 lec. or rec.; 2 cr. (Not offered 1961-62.)

46. THEORY OF OCCUPATIONAL THERAPY. Application of occupational therapy techniques used in treating patients with physical disabilities. Cerebral palsy, poliomyelitis, and the degenerative neurological conditions. Instruction trips to hospitals and treatment centers. Prereq.: O.T. 41, O. T. (49), (50). 2 lec.; 1 lab.; 3 cr.

(49), (50). CLINICAL SUBJECTS. Basic information concerning the etiology, pathology, symptoms, and treatments of disease. Visiting specialists lecture on general medicine and surgery, psychiatry, orthopedics, pediatrics, ophthalmology, and otology. Medical staff. Prereq.: Zool. 17-18 or 17-20. O.T. 41, Psych. 54. One 2-hr. lec.; 1 rec. or instruction trip; 2 cr.

92A. CLINICAL AFFILIATION IN GENERAL MEDICINE AND SURGERY. One or two months full time. No credit.

92B. CLINICAL AFFILIATION IN PEDIATRICS. One or two months full time. No credit.

92C. CLINICAL AFFILIATION IN PSYCHIATRY. Three or four months full time. No credit.

92D. CLINICAL AFFILIATION IN TUBERCULOSIS. One or two months full time. No credit.

92E. CLINICAL AFFILIATION IN PHYSICAL DISABILITIES. Two or three months full time. No credit.

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PHILOSOPHY

ASHER MOORE, *Professor*; ROBERT W. JORDAN, *Associate Professor*; DONALD C. BABCOCK, *Professor Emeritus*

1, 2. **HISTORY OF PHILOSOPHY.** An introduction to the history of Western philosophy through the study of great figures and movements from the Pre-Socratic philosophers to Hegel. Mr. Jordan. (Not open to freshmen.) 3 lec. or rec.; 3 cr.

3. **LOGIC.** An introduction to the problems of knowledge and the principles of valid inference. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

5. **INTRODUCTION TO PHILOSOPHY.** An introductory course designed to acquaint the student with the nature of philosophy, to help him think about his experience philosophically, and to familiarize him with some comprehensive yet radically different accounts which philosophers offer of the nature and meaning of human existence and of its natural and social setting. Mr. Moore. Should be taken by freshmen, by students with little or no familiarity with philosophy, and by those who are not yet sure that they wish to undertake the longer and more systematic treatment offered in Philosophy 1, 2. Open to all students. 3 lec. or rec.; 3 cr. (Offered 1961-62.)

8. **PHILOSOPHY OF HUMAN NATURE.** An introduction to philosophy through the study of representative views of the nature of man and of human decision and conduct, such as the alternatives proposed by theism, naturalism, and existentialism. Mr. Jordan. (Not open to freshmen.) 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

27. **TYPES OF ETHICAL THEORY.** An introduction to the problems of moral philosophy through the study of important traditional and contemporary ethical theories. Mr. Jordan. Prereq.: One semester of philosophy or permission of the instructor. (Not open to freshmen.) 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

54. **PHILOSOPHY OF RELIGION.** A study of the philosophical approach to the nature and significance of religious experience and the fundamental problems of philosophical theology. Mr. Jordan. Prereq.: One semester of philosophy or religion or permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

61. **PLATO.** A systematic examination of Plato's philosophy of human nature through the study of his teaching on art, individual ethics and psychology, politics, and education. Mr. Jordan. Prereq.: One semester of philosophy or permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

(63). **CONTEMPORARY PHILOSOPHY.** A study of representative developments in contemporary philosophy chosen from such important trends as phenomenology, existentialism, and philosophical analysis. Mr. Moore. Prereq.: One semester of philosophy; Philosophy 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Alternate years; offered 1961-62.)

64. **MEDIAEVAL PHILOSOPHY.** A survey of the philosophy of the Middle Ages from Augustine to Scotus. Prereq.: One semester of philosophy (Philosophy 1 is recommended), or permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

DESCRIPTION OF COURSES

65. **AESTHETICS.** An introduction to the philosophy of art through the examination of representative theories concerning the nature of art and aesthetic experience. Prereq.: One semester of philosophy or permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

67. **SEVENTEENTH CENTURY PHILOSOPHY.** A critical and historical survey of important developments in 17th century philosophic thought in Europe and in England. Prereq.: One semester of philosophy or permission of the instructor. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

68. **BRITISH EMPIRICISM.** A systematic and critical study of the philosophy of Locke, Berkeley, and Hume. Prereq.: One semester of philosophy; Philosophy 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

70. **EPISTEMOLOGY.** A systematic study of the problem of knowledge through representative traditional and contemporary theories of cognition. Prereq.: One semester of philosophy; Philosophy 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1961-62.)

72. **METAPHYSICS.** A systematic study of fundamental concepts and problems in metaphysics, such as essence and existence, space and time, substance, causality, and the problem of universals. Prereq.: One semester of philosophy; Philosophy 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

PHOTOGRAPHY

(See *The Arts*)

PHYSICAL EDUCATION FOR MEN

CARL LUNDHOLM, *Director and Professor of Physical Education and Athletics*; PAUL C. SWEET, *Professor*; HENRY C. SWASEY, *Associate Professor*; CLARENCE E. BOSTON, *Associate Professor*; E. WILLIAM OLSON, *Associate Professor*; HORACE S. MARTIN, JR., *Assistant Professor*; A. BARR SNIVELY, JR., *Assistant Professor*; EDWARD J. BLOOD, *Assistant Professor*; ANDREW MOORADIAN, *Assistant Professor*

REQUIREMENTS. Physical Education is required of all freshman men students and first-year students in the Thompson School of Agriculture. Each student must provide himself with an activity suit consisting of gray sleeveless jersey, gray trunks, white woolen socks and rubber-soled tennis or basketball shoes. This suit must be worn at all classes in physical education.

31, 32. **PHYSICAL EDUCATION.** Development of the organic system generally; stimulation of the neuromuscular system through physical activity; encouragement of a proper attitude toward play; development of an appreciation of physical activities as worthwhile leisure-time recreation. *Required of freshmen.* 2 periods; $\frac{1}{2}$ cr. Students passing will get grade of cr.

Teacher Preparation Courses

Required of students registered in the Physical Education Teacher Preparation Curriculum for Men. Elective for other students who are preparing to teach an academic subject as indicated by taking Ed. 41 and planning to take Ed. 57-58.

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23. **PRINCIPLES OF PHYSICAL EDUCATION.** The aims, objectives, and principles of physical education and the historical factors which have influenced the physical life of nations. Mr. Martin and Miss Browne. 3 lec.; 3 cr.

45. **FOOTBALL.** A history of football with consideration of its educational implications and an analysis of the various systems of play. Instruction in team and individual offensive and defensive fundamentals. The rules, theory, strategy, generalship of team play, and the responsibilities of the coach for the physical welfare of the team. Mr. Boston. 1 rec.; 2 lab.; 2 cr.

46. **BASEBALL.** Theoretical and practical consideration of the basic principles of batting and fielding; the fundamentals of each position; special stress on problems involving team play, coaching methods, physical conditioning, and rules; a history of the game with a consideration of its educational values. Mr. Swasey. 1 rec.; 2 lab.; 2 cr.

47. **TRACK AND FIELD ATHLETICS.** Instruction and practical demonstrations in starting, sprinting, middle distance and distance running, relay racing, hurdling, high and broad jumping, pole vault, shot putting, discus, hammer and javelin throwing. Methods of preparing contestants for the various events. Mr. Sweet. 1 rec.; 2 lab.; 2 cr.

48. **BASKETBALL.** History of basketball with a consideration of its educational values. Theory and practice in the fundamentals of individual offense and defense. The various styles of team offense and defense and rules of the game. Problems in handling and conditioning a team. Mr. Swasey. 1 rec.; 2 lab.; 2 cr.

61. **PROBLEMS OF TEACHING IN PHYSICAL EDUCATION.** Methods and materials of instruction, theories of play, and actual practice for the successful teaching of recreational activities in school, in the playground, and in the community. Studies of activities adapted to different levels of maturity. Mr. Lundholm. 3 rec.; 3 cr.

63. **CARE AND PREVENTION OF INJURIES.** Nature and causes of injuries incident to physical activities, the common hazards of play, and preventive measures for children and athletes are discussed. First aid principles are presented. Elective for seniors who have taken one of the following: P.E. 45, 46, 47, 48. Mr. Blood. 2 rec.; 2 cr.

65. **ADMINISTRATION OF PHYSICAL EDUCATION IN SECONDARY SCHOOLS.** The aims and objectives of health and physical education. Organization and supervision of a complete unified program of health and physical education including the legal aspects, intra-mural and inter-scholastic athletics, medical problems, budgeting, financing, maintenance of equipment, publicity programs, and office management. Each student will be given an opportunity to serve on a committee to draw up an original program of health and physical education in a theoretical or actual situation found in some secondary school. Prereq.: Zool. 17-18; P.E. 23 and 61; and two courses in the coaching of sports. These last may be taken concurrently. Mr. Olson. 3 rec.; 3 cr.

93, (93). **EDUCATION-PHYSICAL EDUCATION (Ed-PE). DIRECTED TEACHING IN PHYSICAL EDUCATION.** Given in the Department of Physical Education and Athletics for Men. Prereq.: Zool. 17-18; P.E. 23 and 61. The student must have completed the methods course in the sport which he is directing or take the course concurrently. Mr. Mooradian. 6 lab.; 3 cr.

DESCRIPTION OF COURSES

PHYSICAL EDUCATION FOR WOMEN

MARION C. BECKWITH, *Director and Professor of Physical Education for Women*; EVELYN BROWNE, *Associate Professor*; CAROLINE S. WOOSTER, *Associate Professor*; BARBARA K. NEWMAN, *Associate Professor*; JOAN T. STONE, *Assistant Professor*; JACQUELINE A. CLIFFORD, *Instructor*; B. JOYCE MILLS, *Instructor*; PATRICIA FARRELL, *Instructor*; JANEEN SAND, *Instructor*; HARRIET F. BELFORD, *Instructor**

The Department of Physical Education for Women aims to develop in each individual the physical, social, and mental qualities which will enable her to meet successfully the demands of modern society. The course includes recreational and leisure-time activities, vigorous team sports and gymnastics, rhythmic and dance activity, and the opportunity to participate in club activities which are provided primarily for the more highly skilled. This program is supplemented by the extra-curricular competition sponsored jointly by the Women's Recreation Association and the Department.

REQUIREMENTS. All women students are required to complete at least one credit of physical activity for each of the first six semesters they attend the University. Freshmen women should register for P.E. 1, 2; sophomores for P.E. 3, 4; and juniors for P.E. 5, 6. A second activity may be elected each semester for additional credit (P.E. 11, 12, 13, 14, etc.). Unless there is an elementary and an intermediate section, the same activity shall not be credited more than twice.

PHYSICAL EXAMINATION. Each student must, before entering, have had a physical examination by a physician. A posture test will be given by the Physical Education staff. Individual gymnastics is required of each freshman whose physical condition indicates this need. Students with physical disabilities must follow the same procedure as other students including registration for physical education. In most cases, modified activities are recommended by the University Physician.

MOTOR ABILITY TEST. All students are expected to take the Humiston Motor Ability Test the fall that they enter the University.

ADVANCED INSTRUCTION. To provide for the more highly skilled student and to encourage the interest and ability of the less skilled, the Department includes in its program numerous club and interclass activities in which advanced instruction is given by a member of the teaching staff. Membership: Open to any University student. Qualifications: Club standards or membership of class squad.

Clubs and Instructor: Dance Club — Miss Sand; Rifle club — Miss Browne; Durham Reelers — Miss Farrell; Skating Club — Miss Clifford; Ski Club — Miss Newman; W.R.A. — Miss Stone and staff. A Riding Club is also available — Mr. Kimball, Instructor, Animal Science Department.

Women students following any Teacher Training curriculum are urged to elect for required Physical Education the following activities: folk dancing, recreation workshop, volleyball, hockey, basketball, and American country dancing.

REQUIRED COSTUME, FEES AND EQUIPMENT. Special gymnasium uniforms consist of blue cotton tennis-type dress and shorts, white socks, and regula-

* On half-time.

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tion gymnasium sneakers. Students are required to furnish their own individual equipment for such activities as tennis, skiing, and skating. Equipment is furnished for golf, fencing, badminton, hockey, archery, lacrosse, riflery, and softball. The special riding fee is \$35 a quarter for two periods a week.

1, 2, 3, 4. **PHYSICAL EDUCATION.** Students should register for one activity (meeting three hours a week) from the lists below. Freshmen from A to L elect fundamentals first quarter; from M to Z elect fundamentals second quarter. Sophomores from A to L elect dance survey third quarter; from M to Z elect dance survey fourth quarter. 3 hrs.; 1 cr.

(1), (2), (3), (4). **PHYSICAL EDUCATION.** The parenthesis indicates a first semester course taken second semester and vice versa; this is for transfer students and for those who have failed. See description above. 3 hrs.; 1 cr.

Activity Courses

(elect one each quarter)

First Quarter: Apparatus, archery (elem. + inter.), badminton, dance workshop, fundamentals, golf (elem. + inter.), modern dance, hockey, individual gym, riding* (beg. + elem. + inter. + colt training), speedaway, swimming (majors), tennis (elem. + inter.).

Second Quarter: Basketball, badminton (elem. + inter.), dance workshop, fencing, folk dancing, fundamentals, gymnastics, modern dance (elem. + inter.), individual gym, riding* (beg. + elem. + inter. + colt training), riflery, skating (elem. + figure), skiing (beg.), recreation workshop, stunts and tumbling.

Third Quarter: American country dance, badminton, (elem. + inter.), dance composition, dance survey, dance workshop, elementary games, fencing, individual gym, modern dance (elem. + inter.), riding* (beg. + elem. + inter. + colt training), riflery (elem. + inter.), skating (elem. + figure), skiing (beg. + elem. + inter. + ad), recreation workshop, stunts and tumbling, volleyball.

Fourth Quarter: Archery (elem. + inter.), badminton (elem. + inter.), outdoor education, dance survey, dance workshop, golf (elem. + inter.), individual gym, lacrosse, riding* (beg. + elem. + inter. + colt training), softball, swimming (majors), tennis, (elem. + inter.).

Required of freshmen, sophomores, and juniors. 3 periods; 1 cr.

5, 6. **PHYSICAL EDUCATION.** Elect courses from the list under P.E. 1, 2. Elective for seniors. 2 hrs.; 1 cr.

11, 12, 13, 14, 15, 16, 17, 18. **PHYSICAL EDUCATION.** Elective courses open to freshmen, sophomores, juniors, and seniors respectively may be chosen from the lists under 1, 2, 3, 4. 2 hr.; 1 cr.

Theory Courses

23. **PRINCIPLES OF PHYSICAL EDUCATION.** The aims, objectives, and principles of physical education and the historical factors which have influenced the physical life of nations. Mr. Martin and Miss Browne. 3 lec.; 3 cr.

* See Required Costumes, Fees and Equipment.

DESCRIPTION OF COURSES

24. **ORGANIZED CAMPING.** The methods, objectives, and purposes of organized camping; standards, facilities, equipment, food, sanitation, health, and safety requirements; program planning and leadership qualifications; integration of camping in the public schools. Mrs. Wooster. Elective for sophomores, juniors, and seniors (and freshmen by permission of instructor). 3 lec. or rec.; 3 cr.

(36). **RECREATION LEADERSHIP.** History, trends, community organization, financial aspects of administration, program planning, and leadership of community recreation, including playgrounds. Principles and philosophy of recreation. Miss Farrell. Elective for sophomores, juniors, and seniors. 3 lec. or rec.; 3 cr.

53, 54. **THE THEORY OF TEACHING DANCE.** A survey of methods, materials, and techniques in teaching dance. Includes instruction in performance and teaching of rhythms, social, folk and square dance, first semester; modern dance, second semester. Miss Sand. Prereq.: concurrent with second quarter: folk and square dance; concurrent with third quarter: modern dance (elem.); concurrent with fourth quarter: modern dance (inter.). Open to Physical Education majors or by permission of instructor. 2 lec. or rec.; 1 lab.; 2 cr.

55. **REMEDIAL GYMNASTICS.** The adaption of exercise to individual needs, capacities, and limitations; causes and treatment of physical abnormalities. Theory and technique of massage. Mrs. Wooster. Prereq.: Zool. 17-18; Zool. 19 or concurrently. 2 lec. or rec.; 2 lab.; 3 cr.

56. **HEALTH EDUCATION.** A general health course designed to acquaint the student with methods, materials and principles of teaching school health. Safety education, health examination, and recognition and prevention of disease. Miss Clifford. Open to Physical-Education majors and others by permission of instructor. Prereq.: Zool. 17. 3 lec. or rec.; 3 cr.

63, 64. **THE THEORY OF TEACHING TEAM SPORTS FOR WOMEN.** The methods involved in the teaching of team sports and lead-up games with emphasis on coaching methods and techniques of officiating. Discussion of equipment, history, tactics, and rules of each sport. Miss Stone. Prereq.: Elementary courses in team sports. 2 lec. or rec.; 1 lab.; 2 cr.

(66). **ADMINISTRATION OF PHYSICAL EDUCATION IN SECONDARY SCHOOLS.** Administrative methods in the conduct of physical education, health education, and recreation. The planning of programs and policies in the light of past and present philosophies and in regard to current programs, facilities, equipment, selection of staff, and public relations. Miss Browne. 3 lec.; 3 cr.

73, 74. **THE THEORY OF TEACHING INDIVIDUAL SPORTS FOR WOMEN.** The methods and principles involved in the teaching of tennis, badminton, bowling, skiing, skating, golf, and archery. The history, equipment, courtesies, rules, techniques, and strategy of each sport will be discussed. Miss Beckwith and Miss Mills. Prereq.: Elementary work in the courses listed above. Open to junior and senior majors or others by permission of instructor. 1-2 lec. or rec.; 1-2 lab.; 1-2 cr.

P.E.-Ed. 91. **PROBLEMS IN THE TEACHING OF PHYSICAL EDUCATION FOR WOMEN.** The methods, materials, and organization of a comprehensive program of activities for use primarily in the elementary school and in recreation programs. Miss Newman. Prereq.: Elementary games or its equivalent. 3 lec. or rec.; 3 cr.

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ED-P.E. (92), 92. DIRECTED TEACHING OF PHYSICAL EDUCATION FOR WOMEN. Opportunity for teaching physical education activities under direction, primarily in the elementary and secondary schools. Miss Newman. Prereq.: P.E.-Ed. 91 or concurrently. 1 lec. or rec.; 2 5-hr. lab.; 6 cr.

ED-P.E. (96), 96. RECREATION FIELD WORK. Opportunity for participation in the planning and operation of a variety of recreation programs, under direction, in nearby clubs and community centers. Prereq.: P.E.-Ed. 91 or concurrently: Miss Farrell. 1 lec. or rec.; 2 5-hr. lab.; 6 cr.

PHYSICAL SCIENCE

(See *Geology and Geography*)

PHYSICS

HARRY H. HALL, *Professor*; HORACE L. HOWES, *Professor Emeritus*; JOHN A. LOCKWOOD, *Professor*; WILLIAM H. HARTWELL, *Associate Professor*; DAVID G. CLARK, *Associate Professor*; JOHN E. MULHERN, JR., *Associate Professor*; LYMAN MOWER, *Associate Professor*; ROBERT E. HOUSTON, JR., *Assistant Professor*; LAURENCE J. CAHILL, JR., *Assistant Professor*; SIDNEY R. BUTLER, *Assistant Professor*; JAMES H. TRAINOR, *Instructor*

1-2. INTRODUCTORY PHYSICS. Mechanics, properties of matter, heat, magnetism, electricity, wave motion, sound, and light. Demonstration lectures, laboratory, and recitation. A knowledge of high school algebra and plane geometry is essential. This course is not intended for students in the College of Liberal Arts who expect to complete major requirements in Physics. 2 lec.; 1 rec.; 1 lab.; 4 cr.

9, (9). ELEMENTARY PHYSICS. An elementary course with emphasis on selected topics from the various fields of physics. A knowledge of high school algebra and plane geometry is a prerequisite. Open only to students in the College of Agriculture. 1 lec.; 2 rec.; 1 lab.; 4 cr.

18. GENERAL PHYSICS I. Mechanics. Prereq.: Math. 22 passed or taken concurrently. Must be taken as the introductory course for Physics majors in the College of Liberal Arts. Cannot be counted for major credit. 2 lec.; 2 rec.; 4 cr.

23, 24. GENERAL PHYSICS II, III. Electricity and magnetism, heat, wave motion and sound, light. Prereq.: Phys. 18, Math. 23 passed or taken concurrently. Must be taken as the introductory course for Physics majors in the College of Liberal Arts. Cannot be counted for major credit. 1 lec.; 2 rec.; 1 lab.; 4 cr.

31-32. PHYSICAL MECHANICS. An analytical treatment of classical mechanics covering the methods of statics and dynamics of particles and rigid bodies, both in a plane and in space, and the application of these methods to physical problems; oscillations; constrained motion; generalized co-ordinates and Lagrange's Equations. Prereq.: Phys. 21-22 or 23, 24, Math. 19-20 or 51-52 passed or taken concurrently. 3 rec.; 4 cr.

34. ELECTRICITY AND MAGNETISM. A careful analysis of the concepts of electrostatics, magnetostatics, dielectric theory, alternating currents, and

DESCRIPTION OF COURSES

electromagnetic field theory, leading to Maxwell's equations. Prereq.: Phys. 23, 24, Math. 19-20 or 51-52 passed or taken concurrently. 3 rec.; 4 cr.

35-36. **EXPERIMENTAL PHYSICS I AND II.** Experiments in optics, heat, electricity and magnetism, and atomic physics. Prereq.: Phys. 31-32, 34 and 37, taken concurrently. Phys. 35: 2 lab.; 1 lec.; 3 cr. Phys. 36: 2 lab.; 2 cr.

37. **MODERN PHYSICS.** An introduction to twentieth century physics, including the structure of atoms and nuclei, basic ideas of quantum mechanics and solid state theory. Prereq.: Phys. 23, 24, Math. 23, 24. 3 rec.; 3 cr.

38. **PHYSICAL ELECTRONICS.** An introductory course in basic electronic phenomena, covering such topics as elementary circuit theory, electron emission, vacuum tube characteristics, vacuum tubes as circuit elements, and gaseous discharge. 3 rec.; 3 cr.

43-44. **INTERMEDIATE LABORATORY.** This course extends the student's contact with physical equipment and improves his laboratory technique in precise measurements. Electricity and optics are stressed to a large degree. Prereq.: Phys. 1-2. Intended especially for pre-medical students. 1 lab.; 1 cr.

81. **PHYSICAL OPTICS.** Starting with Maxwell's Equations and covering the nature of light, interference, diffraction, polarization, and related phenomena. Prereq.: Phys. 34, Math. 24. 3 rec.; 3 cr.

82. **THERMODYNAMICS.** Temperature, work, first and second laws, ideal gases, reversibility and irreversibility, Carnot cycle, entropy, properties of pure substances, thermodynamic applications to pure substances, introduction to the principles of statistical mechanics. Prereq.: Phys. 23, 24, Math. 51-52 passed or taken concurrently. 3 rec.; 3 cr.

91. **ATOMIC PHYSICS.** An introduction to quantum mechanics with applications to atomic and molecular spectra. Prereq.: Phys. 34, 37. 3 rec.; 4 cr.

92. **NUCLEAR PHYSICS.** Natural radioactivity, nuclear reactions, nuclear scattering, models of the nucleus, high energy nuclear physics, cosmic rays. Prereq.: Phys. 91. 3 rec.; 4 cr.

93. **INTRODUCTION TO THEORETICAL PHYSICS I. (Electromagnetic Theory).** A review of electrostatics and magnetostatics followed by an introduction to the application of Maxwell's Equations to such topics as the propagation of plane waves, the study of wave guides and resonant cavities, and the theory of scattering, radiation from dipoles, atoms and molecules, the electron theory of dielectrics, and the electromagnetic theory of light. Prereq.: Math. 51-52, and Phys. 34, 37 or equivalent. 4 rec.; 5 cr.

94. **INTRODUCTION TO THEORETICAL PHYSICS II. (Mechanics).** The subject matter will depend upon the background of the class and will include such topics as mechanics of particles, planetary motion, rigid bodies, and introduction to advanced dynamics, theory of vibrations (particles, strings, and membranes), elasticity, hydrodynamics, sound and kinetic theory. Prereq.: Math. 51-52, and Phys. 31-32 or equivalent. 4 rec.; 5 cr.

95-96. **EXPERIMENTAL PHYSICS III-IV.** Work of research type. Special problems are assigned to the individual student. Prereq.: Senior standing in Physics. 2 lab.; 3 cr.

97-98. **PHYSICAL COLLOQUIUM.** Participation in departmental colloquium, reading, and study. Prereq.: Senior standing in Physics. 1 cr.

99. SPECIAL TOPICS. Any selected topics not sufficiently well covered in a general course. Prereq.: Math. 19-20 or 51-52 passed or taken concurrently, and senior standing in Physics. 1, 2, or 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

POULTRY SCIENCE

WINTHROP C. SKOGLUND, *Professor*; RICHARD C. RINGROSE, *Professor*; ALAN C. CORBETT, *Associate Professor*; WILLIAM R. DUNLOP, *Associate Professor*; WALTER M. COLLINS, *Associate Professor*; SAMUEL C. SMITH, *Assistant Professor*; RICHARD STROUT, *Instructor*

2. POULTRY PRODUCTION. The general principles of poultry husbandry and their practical application. Factors of culling, breeding, housing, feeding, marketing, diseases and parasites, incubation, and management. Mr. Skoglund. 2 lec.; 1 lab.; 3 cr.

3. AVIAN BIOLOGY. The anatomy, physiology, and endocrinology of the fowl. Mr. Strout. 2 lec.; 2 cr. (Alternate years; not offered 1961-62.)

4. POULTRY SELECTION AND REPRODUCTION. The theory and principles involved in selection of poultry, embryonic development, and incubation and brooding practices. Mr. Skoglund. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1961-62.)

6. POULTRY NUTRITION. The principles of feeding; analysis of recent experimental work and current feed problems. Mr. Ringrose. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

7. POULTRY HOUSING. Design and construction of poultry houses and equipment; costs of materials; management principles. Mr. Skoglund. 1 lec.; 1 lab.; 2 cr. (Alternate years; not offered 1961-62.)

17. POULTRY JUDGING. Advanced training in poultry selection. A judging team participates in an intercollegiate contest. Mr. Collins. 1 lab.; 1 cr.

19. POULTRY MARKETING. The preparation of poultry and eggs for market. Egg qualities and grades, candling and packaging; egg and poultry market conditions; practical instruction in processing poultry for market. Mr. Ringrose. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1961-62.)

24. TURKEY PRODUCTION. The general principles involved and their application to the production of market turkeys. Mr. Ringrose. 2 lec.; 2 cr. (Alternate years; offered 1961-62.)

26. POULTRY MANAGEMENT. The application of successful business principles to poultry farming; study of surveys and production costs. Visits are made to numerous poultry farms in order to study various types of enterprises. Mr. Skoglund. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

27, 28. POULTRY SEMINAR. Students abstract experimental data and report on various current topics. Department staff. 1-hour conference; 1 cr.

29. POULTRY BREEDING. The principles of Mendelian and population genetics applied to breeding for egg and meat production; genetic and environmental variation; selection, analysis of current breeding systems. Mr. Collins. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1961-62.)

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51-52. **POULTRY DISEASES.** First semester: the fundamentals of disease control. Physiology and anatomy will be briefly covered as background for the study of bacterial, fungus, and parasitic diseases of chickens. Second semester: basic principles of virology with application to the prevention and control of avian virus diseases. Mr. Corbett, Mr. Dunlop, and Mr. Strout. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1961-62.)

53, 54. **POULTRY PROBLEMS.** Students are given a selection of various problems and are required to compile and present accurate and detailed information in their solution. Department staff. 1 to 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

PSYCHOLOGY

HERBERT A. CARROLL, *Professor*; GEORGE M. HASLERUD, *Professor*; BRIAN R. KAY, *Associate Professor*; STANLEY I. BERGER, *Assistant Professor*; WALTER R. DURYEA, *Assistant Professor*; NATHAN BRODY, *Assistant Professor*; FREDERICK M. JERVIS, *Lecturer*

1. (1). **GENERAL PSYCHOLOGY.** The systematic study of human behavior, especially with reference to the fundamental principles governing the development of the individual, motivation, emotion, learning, perception, thinking, and individual differences. Mr. Haslerud, Mr. Kay, Mr. Berger, and Mr. Brody. Not open to juniors and seniors of the College of Liberal Arts. 3 lec.; 3 cr. *This course cannot be counted for major credit.*

32. **INDUSTRIAL PSYCHOLOGY.** A survey of the applications of psychology to business and industry. Communication and human relations, accident prevention, conditions of work, human engineering, motivation of workers, and an introduction to recruitment, selection, and training of personnel. Mr. Kay. Prereq.: Psych. 1 or the permission of the instructor. Not open to freshmen. 3 lec.; 3 cr.

37. **DEVELOPMENTAL PSYCHOLOGY.** Man's behavioral and psychological development and their relation to physical growth. Phylogenetic and ontogenetic development is examined and pertinent animal studies are introduced. The prenatal period is considered along with childhood, adolescence, and early maturity. The developmental methods of study are also an integral part of the course. Not open to freshmen. Mr. Duryea. 3 lec.; 3 cr.

44. **PSYCHOLOGY OF PERSONALITY.** An exploration into the meaning of the normal personality as seen in current psychological perspective. Expressive traits, perceptual orientations, and motives are viewed as interacting components of the personality structure. Case histories, personality tests, and experiments are employed as study methods. Mr. Duryea. Prereq.: Psych. 1 or 37 or 47. Not open to freshmen. 3 lec.; 3 cr.

47, (47). **MENTAL HYGIENE.** An examination of the fundamental emotional satisfactions desired by human beings and a consideration of the several ways in which these desires are thwarted. The mental conflicts growing out of such thwartings and ways of resolving them will be the central theme of the course. Specific applications of the principles of mental health will be made to the problems of college students. Mr. Carroll,

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Mr. Berger, Mr. Duryea, and Mr. Brody. Not open to *first semester freshmen*. 3 lec.; 3 cr. *This course cannot be counted for major credit.*

54. **PSYCHOPATHOLOGY.** A systematic examination is made of the more severe behavioral disorders as found in the major forms of the neuroses and psychoses. The ego defense mechanisms and the construct of anxiety are seen as central to the understanding of these disorders. The search for causes, the interpretation of symptoms, and the methods of treatment. Mr. Berger. Prereq.: Psych. 47. 3 lec.; 3 cr.

57. **EXPERIMENTAL PSYCHOLOGY.** Experimental methods in psychology, including discussion of theory and practices in applying these methods to a variety of psychological phenomena. Each student in the class will be responsible for an individual experimental project. Mr. Haslerud and Mr. Duryea. Prereq.: Psych. 1. 1 lec.; 1 lab.; 3 cr.

58. **PSYCHOLOGY OF LEARNING.** The experimental support for and the practical implications of contemporary theories of learning. Mr. Haslerud. Prereq.: Psych. 1. 3 lec.; 3 cr.

63. **DIFFERENTIAL PSYCHOLOGY.** Individual differences with attention given to those who are intellectually gifted or mentally retarded. Mr. Brody. Prereq.: Psych. 1. 3 lec.; 3 cr.

67. **STATISTICS IN PSYCHOLOGY.** The problems and methods involved in the statistical treatment of quantitative data in psychology. The computation and interpretation of elementary statistical measures such as mean, median, standard deviation, t-test or critical ratio, and the various methods of correlation. Mr. Brody. Prereq.: Psych. 1. 3 lec.; 3 cr.

78. **PHYSIOLOGICAL PSYCHOLOGY.** A study of the relation between behavior and the structure of the organism. The sensory, nervous, and glandular functions as the organic base for motivation, emotion, learning, etc. Mr. Haslerud. Prereq.: Psych. 1. 3 lec.; 3 cr.

83. **SYSTEMATIC PSYCHOLOGY.** An attempt to understand systems in psychology in the light of the major historical antecedents in philosophy and the sciences. Attention is given to the characteristics of systems, their construction and evaluation. Some major classical systems and contemporary theories are handled in light of the foregoing and the student's preferences. Mr. Duryea. Prereq.: Psych. 1. 3 lec.; 3 cr.

86. **PERSONNEL PSYCHOLOGY.** An intensive exploration of the most significant questions confronting business and industry in matters of personnel. Decision making, payment, motivation, automation, philosophy of management, collective bargaining, seniority, testing. Case studies and group discussions around opposed points of view will be used as study methods. Mr. Kay. Prereq.: Psych. 1 (B.A. 68, or Psych. 32 recommended.) 3 lec.; 3 cr.

87. **APPLIED PSYCHOLOGICAL TESTING.** A practical approach to standardized non-projective tests, stressing test construction, interpretation, and administration. The planning and execution of testing programs in institutional settings will be considered. Emphasis will be placed on applicable statistical concepts, normative data, and validating criteria. Mr. Berger. Prereq.: Psych. 1 or their equivalents. 3 lec. 3 cr. (Not offered 1961-62.)

89. **MENTAL HYGIENE IN TEACHING.** The fundamental needs of human beings, with emphasis on the mental and emotional conflicts of secondary-school students arising from the thwarting of these needs. Ways of recognizing these conflicts by their manifestations, and of helping students

- DESCRIPTION OF COURSES

to resolve them. The mental hazards of the teaching profession. Mr. Jervis. Prereq.: Senior or graduate status in Psychology or Education. 3 cr. *Not open to students who have completed Psych. 47.*

95. ADVANCED GENERAL PSYCHOLOGY. A systematic study of current psychology to help the student, by lectures, demonstrations, and reports, to obtain a broad, integrated view of the subject as both science and art. Mr. Haslerud. Prereq.: 12 semester credits in Psychology. 3 lec.; 3 cr. *Required of all undergraduate majors in Psychology.*

98. SEMINAR IN PSYCHOLOGY. An extensive term paper on subjects chosen by the individual student. This project in library research meets the Department's requirement for a comprehensive paper. Mr. Carroll and Mr. Kay. Prereq.: 15 semester credits in Psychology. 3 cr. *Required of all undergraduate majors in Psychology.*

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

PUBLIC SPEAKING

(See Speech and Drama)

RECREATION EDUCATION

(See Physical Education Teacher Preparation Curriculum for Women)

RESERVE OFFICER TRAINING CORPS

Department of Military Science

LIEUTENANT COLONEL JOSEPH P. STABLER, Artillery, *Professor*; MAJOR WARREN W. WITT, Infantry, *Assistant Professor*; CAPTAIN JOHN B. HAMMOND, Infantry, *Assistant Professor*; CAPTAIN ROBERT E. BELFORD, Artillery, *Assistant Professor*; MASTER SERGEANT EDISON E. TEMPLE, *Assistant*; SERGEANT FIRST CLASS CLINTON F. RAMEY, *Assistant*; SERGEANT FIRST CLASS JOHN P. MCINNES, *Assistant*; MASTER SERGEANT CLARENCE P. ANDERSEN, U. S. Army (Retired), *Assistant Military Property Custodian*

The Army Reserve Officer Training Corps offers a course of instruction leading to a commission as a second lieutenant in one of fifteen branches of the United States Army. Successful completion of the course and the award of a baccalaureate degree by the University qualifies the graduate for this commission

The Military Science courses follow the student's normal academic progression, i.e., a student takes Military Science 11-12 during his freshman year and Military Science 21-22 during his sophomore year. If he elects and is accepted for Advanced ROTC, he will take Military Science 31-32 and Military Science 41-42 during his junior and senior years respectively.

The Army basic course satisfies the two-year required military training of the undergraduate by providing instruction in military subjects as noted below.

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To qualify for the advanced course and its military allowance of \$27.00 per month, applicants are required to have earned a minimum overall cumulative grade average of 1.8, to have demonstrated positive leadership potential in the basic course, to be physically qualified, to be selected by the Professor of Military Science, and to be approved for admission to the program by the President of the University.

M.S. 11. FUNDAMENTALS OF MILITARY SCIENCE. The organization of the Army and ROTC, and the Army and national security. Practical training in leadership, marksmanship, military drill, and command provides a balanced picture of the mission of the Army and an introduction to military life. Two hours of classroom instruction plus leadership laboratory. 2 cr.

M.S. 12. CONCURRENT DEVELOPMENT. An integrated course consisting of leadership laboratory conducted by the Army ROTC Department and an elective university subject approved by the Professor of Military Science. The elective course must be selected from the areas of effective communication, science comprehension, general psychology, or political developments and political institutions. A course falling within one of these areas, which is also required in the student's college curriculum, is acceptable. Credit as authorized for the elective course.

M.S. 21. PRINCIPLES OF MILITARY OPERATIONS. An introduction to military operations with emphasis on the principles of firepower and maneuver. Practical application of leadership, drill, and command. Two hours of classroom instruction plus leadership laboratory. 2 cr.

M.S. 22. LAND NAVIGATION AND THE ROLE OF THE ARMY IN NATIONAL SECURITY. The science of military maps and land navigation. An analysis of the role of the Army in national security. Practical application of leadership, drill, and command. Two hours of classroom instruction plus leadership laboratory. 2 cr.

M.S. 31. PROFESSIONAL DEVELOPMENT. Military instruction for two hours each week plus a three-credit academic subject which, in the opinion of the student's faculty adviser and the Professor of Military Science, will contribute to the cadet's potential as a prospective Army officer. The academic subject must be selected from the areas of effective communication, science comprehension, general psychology, or political developments and political institutions. Military instruction, a prerequisite for cadet subsistence pay and commissioning, will include leadership laboratory and branches of the Army. The integrated course of instruction outlined above must provide for a minimum of five hours of instruction per week. Credit as authorized for the elective course.

M.S. 32. MILITARY PROFESSIONAL DEVELOPMENT. The principles of leadership. The theory and practice of teaching methods. The organization, functions, and missions of the various branches of the Army. Small unit tactics. Military communications facilities. Leadership laboratory to include exercise of command of small units. Minimum of five hours of instruction per week. 3 cr.

M.S. 41. PRINCIPLES OF COMMAND AND STAFF. An introduction to the military staff and military staff work to include the relationship between command and staff, relationship of staff to subordinate units, command channels, liaison, military intelligence, and training management. Military logistics to include movements, motor transportation, and supply and

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evacuation. Army administration and military law. Leadership laboratory to include practical application of leadership principles and exercise of command. Minimum of five hours of instruction per week. 3 cr.

M.S. 42. PROFESSIONAL DEVELOPMENT. Military instruction for two hours each week plus a three-credit academic subject which, in the opinion of the student's faculty adviser and the Professor of Military Science, will contribute to the cadet's potential as a prospective Army officer. The academic subject must be selected from the areas of effective communication, science comprehension, general psychology, or political developments and political institutions. Subjects required in a student's academic curriculum during his freshman or sophomore years are excluded, but advanced subjects in the same curriculum are generally acceptable. Military instruction, a prerequisite for cadet subsistence pay and commissioning, will include leadership laboratory, service orientation, and a study of the role of the United States in world affairs. The integrated course of instruction outlined above must provide for a minimum of five hours of instruction per week. Credit as authorized for the elective course.

Department of Air Science

COLONEL JOHN F. BRITTON, USAF, Professor; MAJOR EUGENE J. COGAN, USAF, Assistant Professor; MAJOR DONALD A. LUNDHOLM, USAF, Assistant Professor; CAPTAIN THEODORE J. FINNEGAN, USAF, Assistant Professor; CAPTAIN ROGER S. TEACHOUT, USAF, Assistant Professor; FIRST LIEUTENANT MALCOLM B. ROBERTSON, USAF, Assistant Professor; STAFF SERGEANT JOHNSTONE B. RICHARDSON, Jr., USAF, Assistant; AIRMAN FIRST CLASS JOHN B. MACDONALD, USAF, Assistant; STAFF SERGEANT RALPH G. ORDWAY, USAF, Assistant; AIRMAN FIRST CLASS JAMES H. ALLEN, USAF, Assistant

Entrance requirements for basic Air Force ROTC are lenient, while those for advanced are quite strict. Selection for advanced in both the flying and non-flying categories is based on character, attitude, academic record, and leadership ability. Each cadet selected for advanced Air Force ROTC must be a student in good standing with the University and Air Force ROTC, and must successfully complete a battery of officer qualification tests.

About one-half of those admitted into advanced must be physically qualified for, and desire, flight training. As seniors they will receive 36½ hours of flight instruction under the supervision of the FAA to lead toward a private license. Due to the need for Air Force officers with engineering backgrounds, students taking such courses are urged to apply for the advanced phase.

A.S. 13. AIR LEADERSHIP I. Air laboratory of one hour each week. Course is mandatory for all Air Science freshmen. In addition, the student must successfully complete a University course of at least two credits during the semester. Normally English I will complete this requirement. If such is not the case, History I will suffice for Liberal Arts; Chemistry 1, 3, or 5 for Agriculture and Technology. Variations from these courses will be made through the Department of Air Science. No credit.

A.S. 16. FOUNDATIONS OF AIR POWER I. A general survey of air power, including an understanding of its elements and potentials, research and development, air industries, airlines and airways, control, navigation, and propulsions systems, space vehicles, and military instruments of national

security. Three hours of classroom instruction plus one hour of leadership laboratory. 3 cr.

A.S. 25. FOUNDATIONS OF AIR POWER II. A general survey of the roots and development of aerial warfare, the employment of air forces, the impact of changing weapon systems, operations in space, missiles, bases and facilities, and operations. Three hours of classroom instruction plus one hour of leadership laboratory. 3 cr.

A.S. 28. AIR LEADERSHIP II. Air leadership laboratory of one hour each week. Course is mandatory for all Air Science sophomores. In addition, the student must successfully complete a University course of at least two credits during the semester. Normally one of the following will complete this requirement: English 14, 16; Humanities 2; Foreign Languages; Biology 2, 3; Chemistry 2, 3, 4; Geology 2; Physics 2, 9, 18, 23, 24; Mathematics 2, 3, 7, 8, 21, 22, 23, 24; Education 41; Economics 2; Zoology 48; and Agricultural Engineering 22, 24. The student must designate a substitute course before the semester to the Department of Air Science. Variations from these courses will be made through the Department of Air Science. No credit.

A.S. 35. AIR FORCE OFFICER DEVELOPMENT I. Knowledge and skills required of a junior officer in the Air Force. This includes staff organization and functions, communication, instruction, and techniques of problem solving. Leadership laboratory, as provided by command and staff positions with the cadet wing, prepare the student for the summer training program which normally follows immediately after A.S. 36. Minimum of four hours of formal instruction. Prereq.: A.S.16, 25. 3 cr.

A.S. 36. AIR FORCE OFFICER DEVELOPMENT II. Principles and practices of leadership. This includes basic psychology of leadership, the military justice system, and application of problem solving techniques and leadership theory to simulated and real Air Force problems. Leadership laboratory, as provided by command and staff positions with the cadet wing, prepare the student for the summer training program which normally follows immediately after A.S. 36. During summer training the student will have the opportunity to become familiar with life at an Air Force base and obtain orientation flights in the latest type aircraft in the Air Force. Minimum of four hours of formal instruction. 3 cr.

A.S. 45. WEATHER AND NAVIGATION AND INTERNATIONAL RELATIONS. The first course is a study of the weather and navigation aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, navigational charts and dead reckoning navigation. The second course is devoted to the study of major factors underlying international tensions—balance of power concepts, the League of Nations, the United Nations, and regional security organizations; and the use of the super powers—the United States and Russia. Opportunity to qualify for a private pilot's license is offered to selected cadets. Minimum of four hours of formal instruction and leadership laboratory. 3 cr.

A.S. 46. MILITARY ASPECTS OF WORLD POLITICAL GEOGRAPHY; AND THE AIR FORCE OFFICER. Course is devoted to study of the concepts of the military aspects of political geography, maps and charts, factors of power, and the geographic influences upon political problems with a geographical analysis of the strategic areas. A study is also made of materials to help the cadet make a rapid, effective adjustment to active duty as an officer

DESCRIPTION OF COURSES

of the Air Force. Minimum of four hours of formal instruction and leadership laboratory. 3 cr.

SOCIAL SCIENCE

This course is given under the auspices of the Division of Social Science of the Faculty of the College of Liberal Arts. The Division includes the departments of Economics and Business Administration, Government, History, Hotel Administration, Psychology, and Sociology.

81, (81). **INTERNSHIPS.** Field work in a department of the state or local government or in a selected and approved private agency. The work will be in charge of the department or agency to which the student is appointed. Arrangements for each student will be in charge of the chairman of the department involved or his representative. Prereq.: Internships for seniors only may be approved by the departments of Economics and Business Administration, Government, History, Psychology, or Sociology. Not more than 16 credits. *No more than 9 credits may be counted toward the completion of major requirements.*

SOCIAL SERVICE

(See Social Service Curriculum)

SOCIOLOGY

RICHARD DEWEY, *Professor*; CHARLES W. COULTER, *Professor Emeritus*; MELVILLE NIELSON, *Associate Professor*; STUART H. PALMER, *Associate Professor*; MELVIN T. BOBICK, *Assistant Professor*; MAURICE RICHTER, JR., *Assistant Professor*; OWEN B. DURGIN, *Statistician in the Agricultural Experiment Station*

1. **INTRODUCTORY SOCIOLOGY.** Man's social and cultural relationships as revealed in his customs and institutions. Social theory, methods and techniques of research, and current research findings. 3 lec. or rec.; 3 cr.

2. **SOCIAL PROBLEMS.** How culture in the form of customs and institutions is related to such human problems as crime and delinquency, alcoholism, physical and mental disease, sex pathologies, poverty, old age, broken families, and racial and religious prejudices. Prereq.: Soc. 1. 3 lec. or rec.; 3 cr.

27, (27). **THE FAMILY.** The family as a social institution with special attention given to the contemporary United States family. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Formerly Soc. 72.)

33. **CULTURAL ANTHROPOLOGY.** The concepts and methods of anthropology. The structure of culture; culture and personality; economic, family, educational, political, and religious institutions; art; language. Data concerning various primitive societies are presented. 3 lec. or rec.; 3 cr.

44. **SOCIAL PSYCHOLOGY.** Individual actions, attitudes, ideas, and perceptions as influenced by socio-cultural environments. Individual-cultural relations in education, religion, economics, aesthetics, ethics, and deviant behavior. Prereq.: Soc. 1 or Psych. 1. 3 lec. or rec.; 3 cr.

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45. **RURAL-URBAN SOCIOLOGY.** Application of sociological principles to the study of customs and institutions in rural and urban settings. Differentiation between influences upon community organization of culture on the one hand and population size and density on the other. Prereq.: Soc. 1. 3 lec. or rec.; 3 cr.

52. **POPULATION ANALYSIS.** A seminar course in demography. Current and past theories of population change. The population structure and potential growth of various countries, and the import of such information for U. S. policies. Drawing on the materials from the U. S. Census of Population and U. S. Vital Statistics, the population of this country is examined in terms of: (1) its distribution by age, sex, race, marital status, and level of education; (2) the differential rates of birth and death for different sub-populations; and (3) the patterns of migration within and between states. Methods for determining the various rates and indices of change, and the limits on their use. Prereq.: Soc. 2. 3 lec. or rec.; 3 cr.

54. **CULTURE CHANGE.** Theories of culture change are evaluated. The processes of discovery, invention, diffusion, and acculturation are illustrated by selected anthropological studies of the culture of non-literate and literate societies. Prereq.: Soc. 1 or 33. 3 lec. or rec.; 3 cr.

57. **SOCIAL STRATIFICATION.** Social class systems with special attention given to the class structure in the United States. Prereq.: Soc. 1. 3 lec. or rec.; 3 cr.

58. **MINORITY GROUPS.** Majority-minority group relations with special attention given to racial, religious, and ethnic minority groups in the United States. Prereq.: Soc. 1. 3 lec. or rec.; 3 cr. *Sociology 58 is not open to students who have credit for Sociology 34.*

59. **AGING IN THE AMERICAN SOCIETY.** Social differentiation on the basis of age groups, with the aged in the contemporary American society being emphasized. Attitudes and behavior toward the aged, attitudes and behavior of the aged, and problems of the aged in society. Proposed programs for change in the treatment and behavior of the aged. 3 lec. or rec.; 3 cr. (Not offered 1961-62.)

62. **SOCIAL MOVEMENTS.** The factors related to the origin and development of reform, revolutionary, religious, and other social movements. The organization, structure, tactics, and leadership of social movements. The purposes and consequences of selected movements, as well as to the relationships between social movements and social change. Prereq.: Soc. 1. 3 lec. or rec.; 3 cr.

71, (71). **CRIMINOLOGY.** The scientific study and the control of crime. Indexes and rates of crime; theories of crime; juvenile delinquency; police courts, prisons, probation, and parole. Case studies are presented. 3 lec. or rec.; 3 cr.

73, 74. **INTRODUCTION TO SOCIAL WELFARE.** The field of social welfare: history, public welfare, case work, social group work, community organization for social welfare. For Sociology majors and students enrolled in the Social Service curriculum; others may be admitted by permission of the instructor. 3 lec. or rec.; 3 cr.

75-76. **METHODS OF SOCIAL RESEARCH.** Analysis of research problems. Designing field studies and experiments. Demonstration and practice in sampling, schedule construction, and interviewing techniques. First semester: use of elementary statistical techniques in analysis of prepared data.

DESCRIPTION OF COURSES

Second semester: methods of observation. For Sociology majors and students enrolled in the Social Service curriculum; others may be admitted by permission of instructor. 3 lec. or rec.; 3 cr.

85, 86. DEVELOPMENT OF SOCIOLOGICAL THEORY. Social thought from Plato to the present. First semester: the works of selected individuals from Plato to Comte. Second semester: the 19th century European social philosophers; the ideas of U. S. social scientists, especially upon their contributions to present day sociological thought. Students not majoring in Sociology may be admitted by permission of the instructor. 3 lec. or rec.; 3 cr.

88. CRIME CONTROL. A seminar course on the theory and practice of preventing crime and delinquency and of rehabilitating the criminal and the delinquent. There will be a number of lectures by, and discussions with, various penologists. Prereq.: Soc. 71. Permission of instructor. 3 cr. (Limited to 15 students.)

92. FIELDS OF SOCIOLOGY. Various subject areas of sociology: their growth and development, their relationship to one another, and their current status with regard to research and theory. Recent developments and the newer subject areas of sociology. Future developments, as extensions of present trends. Students not majoring in Sociology may be admitted by permission of the instructor. 3 lec. or rec.; 3 cr.

93. MASS COMMUNICATION. How press, radio, and screen perform essential functions in our society. Content of their messages, characteristics of their audiences, and probable impact, using current periodicals, films, and broadcasts as material. The importance of word-of-mouth communication as pattern and sounding board of mass communication. Prereq.: Permission of the instructor. 3 lec. or rec.; 3 cr.

97. SOCIAL WELFARE FIELD EXPERIENCE. To give the student an understanding of social welfare through observation and participation. Students will work in a social welfare setting for a period of eight weeks (or its equivalent). This field work is generally done during the summer following the junior year. Weekly seminar sessions constitute the classroom work of the course. Prereq.: Soc. 73, 74 and permission of the instructor. 6 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

SPEECH AND DRAMA

JOSEPH D. BATCHELLER, *Associate Professor*; EDMUND A. CORTEZ, *Professor*;
PHYLLIS D. WILLIAMSON, *Instructor*; JAMIL I. TOUBBEH, *Instructor*

B. SPEECH IMPROVEMENT. All entering freshmen and transfer students are required to take a speech test. They are classified as Group I, having no apparent problem; Group II, needing speech improvement; or Group III, having relatively serious speech problem. Those students classified in Group III are required to meet individually or in groups with the staff and students in clinical practice for non-credit Speech Improvement until such time as they have made sufficient improvement. A student may be remanded to Speech Improvement by any instructor with the approval of the Speech staff. This course replaces English B. Mrs. Williamson. No cr.

5, (5). BASIC SPEECH. A beginning course in the social, psychological, physiological, and phonetic bases of speech. Projects in informal public

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speaking, oral interpretation, discussion, and elementary phonetic transcription are used: (1) to illustrate the bases and (2) for the improvement of the individual student. This course is strongly recommended for those students who are classified in Group II on the speech test. Required of all majors, but without major credit. Mrs. Williamson. 3 rec.; 3 cr.

15, (15). PUBLIC SPEAKING. The basic speaker, materials, presentation, occasion, and audience relationships. An introduction to extemporaneous and impromptu speaking for the purposes of informing and convincing. Practice in speaking with evaluation and constructive comment by the instructor and audience. Cannot be counted for major credit. This course replaces English 35 and should not be taken by anyone who has credit for English 35. Mr. Cortez and staff. 3 rec.; 3 cr.

21. INTRODUCTION TO THEATER ARTS. The basic elements common to the varied media of theater; legitimate, musical, cinema, and television. The place of the theater in our lives. An introduction to theater practices from the script to production. 2 lec.; 1 lab.; 3 cr.

24. THEATER AND ITS DRAMA. The relation of theater and its drama to the society in which it is produced. A comparative study of outstanding modern plays and historical counterparts. 3 lec.; 3 cr.

25. DISCUSSION. The means and ends, values, and limitations of the various types of discussion. Group dynamics, logic and evidence, and parliamentary procedure as applied to learning and problem solving. Practice in using various methods to gain the objectives of discussion. This course replaces English 33 and should not be taken by anyone who has credit for English 33. Mrs. Williamson. 3 rec.; 3 cr.

28. DEBATE. The various forms of advocacy as an extension of discussion. The analysis of propositions, the construction of a case, logic and ethical persuasion, and the presentation of speeches of advocacy. The course replaces English 34 and should not be taken by anyone who has credit for English 34. Mrs. Williamson. 3 rec.; 3 cr.

29, (29). DISCUSSION AND DEBATE PRACTICE. Responsible preparation for and participation in intra- and inter-collegiate discussion or debate. May be repeated to a total of 4 credits toward graduation. Cannot be counted for major credit. Prereq.: Debate and approval of the instructor. Mrs. Williamson. 1 cr.

37, (37). STAGECRAFT. An introduction to stage and television scenery, costumes, properties, lighting, sound, and backstage organization. Practical application in University Theater productions. This course replaces Arts 35 and should not be taken by anyone who has credit for Arts 35. Mr. Toubbeh. 1 lec.; 2 lab.; 3 cr.

40. SCENIC DESIGN AND LIGHTING. A study of the problems of stage design and lighting for theater and television. Individual projects, models, and participation in University Theater and television productions. Prereq.: Stagecraft or approval of the instructor. 1 lec.; 2 lab.; 3 cr.

43. ACTING. The relation of the actor to other theater workers in producing a play. Analysis of the role, creation of images, rehearsal and performance problems of legitimate theater and television. This course replaces English 47 and should not be taken by anyone who has credit for English 47. Prereq.: 6 credits in Speech and Drama or approval of the instructor. 1 lec.; 2 lab.; 3 cr.

DESCRIPTION OF COURSES

45, (45). THEATER PRACTICE. Application of the theory of acting, directing, or the technical aspects of production to specific assigned responsibilities in University Theater productions. May be repeated to 4 credits toward graduation, but cannot be counted for major credit. Prereq.: the basic courses in which the practice credit is taken and approval of the instructor. Mr. Batcheller. 1 cr.

49. TELEVISION AND RADIO WORKSHOP. The application of basic theater techniques to electronic means of mass communication. The place of television and radio in our society. Production techniques. Actual practice in campus studios. Mr. Cortez. 1 lec.; 2 lab.; 3 cr.

52. RHETORIC IN THE WESTERN WORLD. A study of great speeches in the history of western civilization; an analysis of the reasons for their success or failure on a basis of the speaker, his materials, the logical and persuasive appeals, the audience background and attitudes, and the occasion. Of special interest to history, government, sociology, and psychology majors as well as students interested in relationships of language and social problems. Prereq.: 6 credits in Speech and Drama or approval of the instructor. Mrs. Williamson. 3 lec.; 3 cr. (Alternate years; offered in 1961-62.)

53. SPEECH CORRECTION. Further study of the psychological, physiological, and phonetic bases of speech with the addition of the neurological, genetic, and physical bases towards the end of recognizing abnormalities of speech, some of their causes, and their basic therapy. Delayed speech, articulatory and voice disorders, foreign dialects, stuttering, and audiology are the principal problems studied. Prereq.: Basic Speech or approval of the instructor. Mrs. Williamson. 3 lec.; 3 cr.

56. CLINICAL METHODS. A continuation of Speech Correction dealing with the theory of remedial practices for various speech problems and providing experience in speech therapy by demonstration and laboratory in conjunction with Speech Improvement. Prereq.: Speech Correction. Mrs. Williamson. 1 lec.; 2 lab.; 3 cr. (Alternate years; not offered in 1961-62.)

62. DIRECTING. The analysis of the script, the determination of specific treatment of the production, the development of a prompt script, casting, rehearsal, and production for legitimate theater and television. This course replaces English 48 and should not be taken by anyone who has credit for English 48. Prereq.: 6 credits in Speech and Drama or approval of the instructor. 1 lec.; 3 lab.; 3 cr.

64. SPEECH FOR PROSPECTIVE TEACHERS. Developing an adequate conversational form of speaking before the class; speech improvement for the prospective teachers; voice recording and analysis; oral interpretation of both prose and poetry; making and using visual aids; and the means of developing a communicative speaker-audience relationship. This course replaces English 36 and should not be taken by anyone who has credit for English 36. Mr. Cortez. 3 rec.; 3 cr.

UNIVERSITY OF NEW HAMPSHIRE

ZOOLOGY

GEORGE M. MOORE, *Professor*; C. FLOYD JACKSON, *Professor Emeritus*; LORUS J. MILNE, *Professor*; EDYTHE T. RICHARDSON, *Professor*; EMERY F. SWAN, *Associate Professor*; WILBUR L. BULLOCK, *Associate Professor*; PAUL E. SCHAEFER, *Associate Professor*; MARIAN H. PETTIBONE, *Associate Professor*; PAUL A. WRIGHT, *Associate Professor*; PHILIP J. SAWYER, *Associate Professor*; MARCEL E. LAVOIE, *Assistant Professor*; MERRITT A. GIBSON, *Assistant Professor*

7. GENERAL ZOOLOGY. Systematic survey of the animal kingdom, including the natural history and functional relationships, accompanied by dissection of selected types. Prereq.: Biol. 2, 3, or Zool. 48. 3 lec.; 2 lab.; 5 cr.

8. COMPARATIVE ANATOMY. Fundamental principles of comparative vertebrate anatomy. Selected vertebrate types are dissected. Prereq.: Zool. 7. 3 lec.; 2 lab.; 5 cr.

17. HUMAN ANATOMY. The structure of the human body including gross and microscopical anatomy of the various systems. Mr. Lavoie. Prereq.: Biol. 2 or 3. 3 lec.; 1 lab.; 4 cr. (*Not open to those who have credit for Zool. 8.*)

18. HUMAN PHYSIOLOGY. The principles involved in the functioning and integration of the various systems of the body. Mr. Lavoie. Prereq.: Zool. 17 or Zool. 8. 3 lec.; 1 optional lab.; 3 or 4 cr.

19. KINESIOLOGY. Bodily movements. The relation of skeleton, muscles, and joints in movements. Designed primarily for Occupational Therapy students and for students in the Physical Education Teacher Preparation curriculum. Mrs. Richardson. Prereq.: Zool. 18. 2 lec.; 1 lab.; 3 cr.

36. ORNITHOLOGY. Birds, their identification, migration, life history, and economic importance with special reference to those of eastern North America. Mr. Sawyer. Prereq.: Biol. 2 or 3 or equivalent. 1 lec.; 2 lab. or field trips; 3 cr.

48. PRINCIPLES OF ZOOLOGY. The principles of animal biology, including ecological relationships, embryology, physiology, and genetics, with emphasis on man and other vertebrates. Mr. Bullock. *Required of freshmen in Agriculture.* 2 lec.; 1 lab.; 3 cr. *This course cannot be used to satisfy major requirements.* (Not open to those who have credit for Biol. 1-2, or 3.)

Advanced Courses in Zoology

All the following courses require junior or senior standing.

51. PARASITOLOGY. An introductory course on some of the more important parasites causing diseases of man and animals. Mr. Bullock. Prereq.: Biol. 2, or 3, and a year of Zoology. 2 lec.; 2 lab.; 4 cr.

55, 56. INVERTEBRATE ZOOLOGY. The morphology, phylogeny, and natural history of the major invertebrate groups. Staff. Prereq.: General Zoology. 2 rec.; 2 lab.; 4 cr.

57. COMPARATIVE PHYSIOLOGY. A survey of means whereby animals, both vertebrate and invertebrate, have met the problems of irritability, nutrition, maintenance of a constant internal environment, and reproduction. Mr. Lavoie. Prereq.: Biol. 2, or 3, one year of Zoology, college Physics, and Organic Chemistry. 3 lec.; 1 lab.; 4 cr.

DESCRIPTION OF COURSES

59. **GENERAL PHYSIOLOGY.** The fundamental physiological properties of excitability, contractility, conductivity, metabolism, growth, and reproduction. Mr. Wright. Prereq.: Biol. 2, or 3, one year of Zoology, a year of college Physics, and a course in Organic Chemistry. 3 lec. or rec.; 1 lab.; 4 cr. (Alternate years; not offered 1961-62.)

61. **GENETICS.** The physical basis of inheritance, expression, and interaction of the hereditary units, linkage, and variation. The application of Mendelian principles to plant and animal breeding. Mrs. Richardson. Prereq.: Biol. 2, or 3, or Bot. 1 and Zool. 48. 3 lec. or rec.; 3 cr.

62. **ADVANCED GENETICS.** The recent advances in genetics and cytogenetics. Mrs. Richardson. Prereq.: Zoology 61. 2 lec.; 2 lab.; 4 cr.

64. **NEUROLOGY.** Practical study of morphology, physiology, and histology of the human nervous system. Mrs. Richardson. Prereq.: Biol. 2, or 3, and one year of Zoology. 3 lec. or rec.; 1 lab.; 4 cr.

65. **EMBRYOLOGY.** The fundamental principles of development. The developmental process from the egg to the formation of the body and the establishment of the principal organs and systems. Mr. Gibson. Prereq.: Zool. 7. 2 lec.; 2 lab.; 4 cr.

66. **ELEMENTS OF HISTOLOGY AND MICROTECHNIQUE.** The microscopic anatomy of principal tissues and organs of vertebrates with an introduction to general histological techniques. Mr. Gibson. Prereq.: Zool. 8 or 17. 2 lec.; 2 lab.; 4 cr.

71. **PRINCIPLES OF ECOLOGY.** The interrelationships of plants and animals with both their living and non-living environments. Attention will be given to energy relationships, limiting factors, community organization, succession and biogeography. Staff. 3 rec.; 3 cr.

72. **ADVANCED ECOLOGY.** (a) Terrestrial, (b) Freshwater, (c) Marine. An intensive study of the ecology of one of the major habitat areas with the application of general ecological principles and of methods especially applicable to the habitat studied. Staff. Prereq.: A course in Principles of Ecology and permission of the instructor. 2 rec.; 2 labs.; 4 cr. Different subdivisions of this course may be taken to a total of not more than 12 credits.

77, 78. **NATURAL HISTORY AND TAXONOMY OF THE VERTEBRATES.** A study of the various classes of vertebrates; their habits, habitats, and life histories with special reference to those occurring in eastern North America. Zoology 77 will include the fishes, amphibia, the reptiles. Zoology 78 will cover the mammals and birds. Mr. Sawyer. Prereq.: General Zoology. 2 rec.; 2 labs.; 4 cr.

97, 98. **SPECIAL PROBLEMS.** Advanced students may elect a special problem provided they present a detailed outline of the subject and can furnish adequate proof of their ability to carry it out with equipment available. Mr. Moore and staff. Prereq.: Permission of the Chairman of the Department. 1-4 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE
GRADUATE SCHOOL

Summary of Registration

	AGRICULTURE				LIBERAL ARTS				TECHNOLOGY				MISCELLANEOUS				TOTAL												
																	MEN			WOMEN			Both						
	1959-60	1958-59	1957-58	1956-57	1959-60	1958-59	1957-58	1956-57	1959-60	1958-59	1957-58	1956-57	1959-60	1958-59	1957-58	1956-57	1959-60	1958-59	1957-58	1956-57	1959-60	1958-59	1957-58	1956-57	1959-60	1958-59	1957-58	1956-57	
Senior	62	65	80	56	517	493	483	425	129	153	144	130	.....	.....	.....	.....	498	490	514	434	210	221	193	177	708	711	707	611	
Junior	42	61	68	78	536	530	525	506	153	177	191	160	.....	.....	.....	.....	488	547	547	536	263	221	237	208	731	768	784	744	
Sophomore	69	45	69	83	657	567	511	589	158	180	204	219	.....	.....	.....	.....	574	530	554	596	310	262	230	295	884	762	784	891	
Freshman	76	84	57	82	696	714	571	626	256	263	248	267	.....	.....	.....	.....	637	650	585	677	391	411	291	298	1028	1061	876	975	
Specials	6	7	12	4	76	85	75	47	13	20	24	20	.....	.....	.....	.....	60	89	76	40	35	43	35	31	95	132	111	71	
Graduates .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	252	249	242	192	197	211	193	151	55	38	49	41	252	249	242	192	
Total-Regular curricula	255	262	286	303	2482	2389	2165	2193	709	793	811	796	252	249	242	192	2434	2517	2469	2434	1264	1196	1035	1050	3698	3713	3504	3484	
Non-degree curricula .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
2nd year, TSA	29	22	28	27													27	20	27	27	2	2	1	1		29	22	28	27
1st year, TSA	40	55	39	39													40	55	38	38	1	1	1	1		40	55	39	39
Total	69	77	67	66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67	75	65	65	2	2	2	1	69	77	67	66	
Summer School .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Extension courses .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1127	934	801	732	628	544	408	386	499	890	393	346	1127	934	801	732	
General Electric .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	†1971	†1735	*884	774	1275	1072	549	528	690	663	335	246	1971	1737	884	774	
Total — short curricula .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44	52	39	34	44	52	39	34	.....	.....	.....	.....	44	52	39	34	
Grand Total	69	77	67	66	.....	.....	.....	.....	.....	.....	.....	.....	3142	2721	1724	1540	2014	1743	1061	1013	1197	1055	730	593	3211	2800	1791	1606	
Less duplicates	324	339	353	369	2482	2389	2165	2193	709	793	811	796	3394	2970	1966	1732	4448	4260	3530	3447	2461	2251	1765	1643	6909	6511	6295	5090	
NET GROSS TOTALS	324	339	353	369	2482	2389	2165	2193	709	793	811	796	2915	2691	1701	1508	4100	4027	3372	3273	2330	2205	1658	1593	6430	6232	6030	4866	

* Semester I, 1957-58.
† Semester I and II, 1958-59, 1959-60.

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General Information
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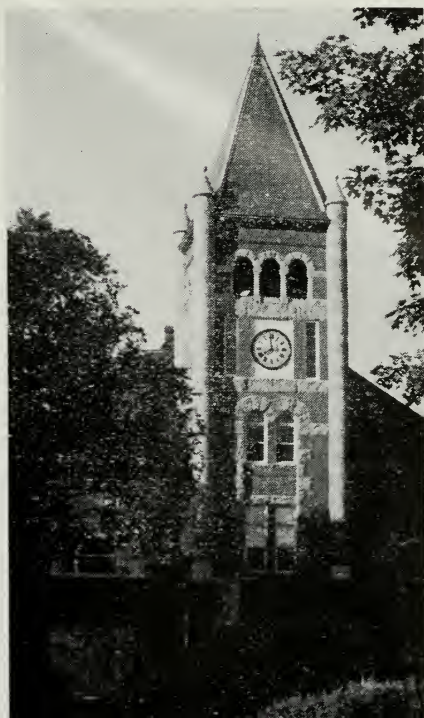
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about the

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1961

Summer Session

June 26	Monday	Registration for eight-week session and first four week session, Strafford Room, Memorial Union
June 27	Tuesday	First class meeting, eight-week session and first four-week session
July 1	Saturday	Classes meet to make up for registration day
July 4	Tuesday	Holiday, no classes
July 10	Monday	Registration for six-week session, Strafford Room, Memorial Union
July 11	Tuesday	First meeting for classes in six-week session
July 15	Saturday	Classes will meet, all courses, to make up for July 4 holiday and registration day
July 21	Friday	First four-week session ends
July 24	Monday	Registration and first meeting of classes for second four-week session, Thompson Hall
Aug. 18	Friday	Summer Session ends (all sessions)

Semester I

Sept. 10	Sunday	2:00 p.m. Residence halls open for incoming freshmen
Sept. 11	Monday	9:00 a.m. Testing of freshmen not tested during summer
Sept. 12-17	Tuesday to Sunday	Orientation
Sept. 12	Tuesday	First Faculty meeting
Sept. 14	Thursday	2:00 p.m. Residence halls open for upperclassmen
Sept. 15-16	Friday and Saturday	8:30 a.m. to 12:00; 1:30 p.m. to 4:00. Registration of all students, Memorial Union. (Student must have consulted adviser and have approved program before he appears for registration)
Sept. 18	Monday	Classes begin at 8:00 a.m.
Sept. 27	Wednesday	4:30 p.m. Last day to add most academic courses
Oct. 14	Saturday	Homecoming
Oct. 16	Monday	4:30 p.m. Last day to drop courses
Nov. 6	Monday	9:00 a.m. Mid-semester reports for freshmen due in Office of the Registrar, Thompson Hall 102
Nov. 21	Tuesday	Thanksgiving recess begins at 6:00 p.m.
Nov. 21	Tuesday	7:00 p.m. Residence halls close for Thanksgiving recess
Nov. 26	Sunday	2:00 p.m. Residence halls open
Nov. 27	Monday	Classes resume at 8:00 a.m.
Dec. 16	Saturday	Christmas recess begins at 12:30 p.m.; residence halls close at 2:30 p.m.

University Calendar

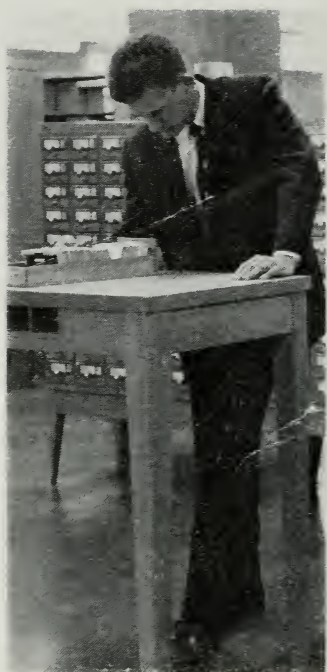
1961-1962

1962

Jan. 2	Tuesday	2:00 p.m. Residence halls open
Jan. 3	Wednesday	Classes resume at 8:00 a.m.
Jan. 22	Monday	Final examinations begin, 9:00 a.m.
Jan. 30	Tuesday	Final examinations end, 5:00 p.m. 7:00 p.m. Residence halls close for Semester I

Semester II

Feb. 4	Sunday	2:00 p.m. Residence halls open for Semester II
Feb. 5-6	Monday and Tuesday	8:30 a.m. to 12:00; 1:30 p.m. to 4:00. Registration of all students, Memorial Union. (Student must have consulted adviser and have approved program before he appears for registration)
Feb. 7	Wednesday	Classes begin at 8:00 a.m.
Feb. 16	Friday	4:30 p.m. Last day to add most academic courses
Mar. 6	Tuesday	4:30 p.m. Last day to drop courses
Mar. 26	Monday	9:00 a.m. Mid-semester reports for freshmen due in Office of the Registrar, Thompson Hall 102
Mar. 31	Saturday	Spring recess begins at 12:30 p.m.; residence halls close at 2:30 p.m.
Apr. 8	Sunday	2:00 p.m. Residence halls open
Apr. 9	Monday	Classes resume at 8:00 a.m.
Apr. 22	Easter (Sunday)	
May 5	Saturday	Parents Day, classes end at 11:00 a.m.
May 30	Wednesday	Memorial Day, no classes
June 4	Monday	Final examinations begin 9:00 a.m.
June 12	Tuesday	Final examinations end, 5:00 p.m. Residence halls close for Semester II at 7:00 p.m.
June 17	Sunday	Commencement Day



The Programs of Study

RESIDENT instruction is offered in the College of Agriculture, the College of Liberal Arts, including the Whittemore School of Business and Economics, the College of Technology, the Graduate School, the Summer Session, the Departments of Physical Education for Men and for Women, the Division of Reserve Officer Training, and the Thompson School of Agriculture.

The University confers the following degrees:

College of Agriculture — Bachelor of Science in Agriculture, in Agricultural Engineering, in Forestry, and in Home Economics. In the Thompson School of Agriculture, a Certificate of Graduation.

College of Liberal Arts — Bachelor of Arts and Bachelor of Science.

College of Technology — Bachelor of Science in Chemistry, in Chemical Engineering, in Civil Engineering, in Electrical Engineering, in Mathematics, in Mechanical Engineering, and in Physics.

Graduate School — Master of Arts, Master of Education, Master of Science, Master of Science in Engineering, Master of Agricultural Education, Master of Science in Forestry, Master of Science for Teachers, Doctor of Philosophy.

The work of the University is divided so that when a student decides upon a general field of studies or a vocation, he is guided into a curriculum fitted to his purpose. The student who chooses the General Liberal Arts curriculum takes several courses in the subject he chooses as his *major*, but elects many other courses to broaden his education. The student who chooses certain of the engineering curriculum, on the other hand, is confined principally to courses prescribed for him, most of which are technical or scientific. The other curricula fall between these two extremes.

Except for the desirability of choosing among the three broad fields of Agriculture, Liberal Arts, and Technology, the freshman entering the University may delay final selection of a curriculum until he has been in attendance for a semester or more. Although there are some advantages in making an early decision, even when a student feels sure of his choice, he should bear in mind the possibility that he may change his mind and that it is well to avoid over-specialization in high school or in the first part of a college career. No one can foresee the trend of the future. Therefore, the wise person is one who is prepared to make his way in more than one field.

The high-school senior should talk over his future plans with his teachers, guidance officer, and principal. *Officials of the University also will be glad to consult with him, preferably in an interview, but if that is not feasible, by mail.*

Each year, the University gives the entering freshman a series of tests. The object of these tests is to furnish additional information to enable the faculty of the University to help the student choose the curriculum for which he is best fitted. The faculty advisers and the Counseling Service staff use these tests to help students solve their educational and personal problems.

Certain courses are pursued by all students in the University. English is required of all students in the freshman year. During their first six semesters of attendance women students are required to take physical education. All men students, except those who have been in the military service, are required to take physical education for two semesters and military training during their first four semesters.

The University reserves the right to withdraw any course or curriculum announced in the catalogue or to substitute other courses or curricula therefor.

Some of the words used to describe academic work will be unfamiliar. For this reason the following terms used in this section are defined.

Semester. This is half of the college year. The fall semester starts in September and ends about the last of January. The spring semester starts about the first of February and ends in June.

Semester Hour. The semester hour represents one hour of class or about two hours of laboratory each week for a semester. Most college courses meet three days a week for an hour each day. They therefore are valued at three semester hours. A science course with three class meetings a week plus one laboratory period would have a value of four semester hours. In the College of Liberal Arts, 128

semester hours are required for graduation; in Agriculture, 136; and in Technology, 144.

Course. This term is used to describe the work of a semester in a specific subject such as algebra, American history, or organic chemistry. Each course has assigned to it a value in semester hours credit.

Curriculum. This is a plan of study made up of courses arranged to satisfy the requirements for graduation in a particular field, for example: Civil Engineering, Poultry Science, Business, or General Liberal Arts.

Major. A student in the General Liberal Arts curriculum chooses some subject such as English, Zoology, or History as his principal subject. This is said to be his major.

The undergraduate work of the University is offered in three Colleges: Agriculture, Liberal Arts. and Technology.

The College of Agriculture

The objectives of the College of Agriculture are to give students a fundamental education in the biological, physical, and social sciences and to provide specific technical training according to student interest in Agriculture, Agricultural Engineering, Forestry, or Home Economics.

Agriculture is broader than the production of food and fiber. It includes, in addition to production, the processing, distributing, and marketing of agricultural products and the servicing of production. A wide range of career opportunities is provided for adequately prepared college graduates. Governmental agencies, both advisory and regulatory, offer other career opportunities for graduates of agricultural colleges.

Many graduates of the College of Agriculture continue their education beyond the Bachelor's degree and obtain advanced degrees to qualify for specialized positions in teaching, research, extension, industry, or civil service. The program of study for a student who plans to enter graduate school will differ from that of a student who intends to accept a position immediately after completing the Bachelor's degree. The intent of the college is to help the student select a career and to prepare him or her for competence and leadership in that career.

Upon admission to the College of Agriculture the student will declare what degree he or she seeks. The following degrees and curricula are available:

Bachelor of Science in Agriculture

Agricultural Business and Marketing
Agricultural Science
Agricultural Technology

Bachelor of Science in Agricultural Engineering

Agricultural Engineering

Bachelor of Science in Forestry

Forestry
Forest Game Management

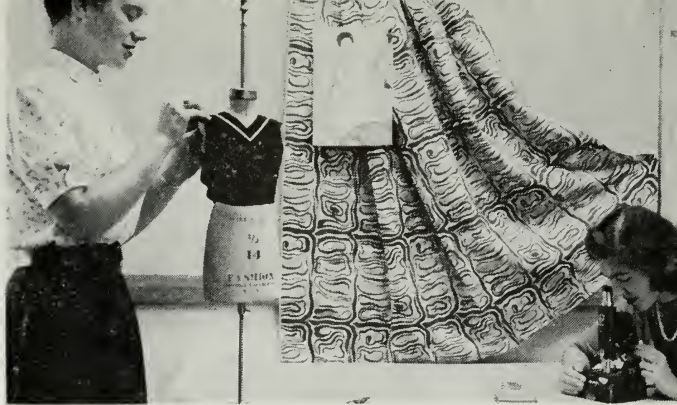
Bachelor of Science in Home Economics

General Home Economics
Clothing and Textiles
Foods, Nutrition and Industrial Management
Home Economics Education

The student may select a curriculum and an area of specialization at the time of registration as a freshman or wait until the sophomore year to make these decisions. The student is assigned an adviser from one of the areas of specialization as follows: Biochemistry, Agricultural Economics, Agricultural Engineering, Agronomy, Animal Science, Botany, Dairy Science, Entomology, Forestry, Home

BOTANY





HOME ECONOMICS

Economics, Horticulture, Mechanized Agriculture, Poultry Science, Pre-Veterinary, or Teacher Preparation in Agriculture.

For a Bachelor of Science degree in Agriculture, Forestry, or Home Economics, each candidate must complete 136 semester credits; for a Bachelor of Science degree in Agricultural Engineering, 144 semester credits are required.

Thompson School of Agriculture

The Thompson School of Agriculture, a unit of the College of Agriculture, offers a two-year non-degree program of study. Any high-school graduate of good character or any student who has completed a minimum of two years of high school and is eighteen years of age or over may be admitted. Two years of class work and two years of summer placement for supervised agricultural work experience are required for graduation.

Instruction in the Thompson School is designed to prepare students for careers in the broad field of agriculture. Typical examples are: farming, farm managers, herdsman; greenhouse superintendents, ornamental horticulture and landscape technicians; sales and service work with feed, fertilizer, chemical, and equipment companies; soil conservation, fish and game conservation; foremen, technicians, and skilled workers in dairy processing and distributing plants. The program is vocational in nature. Because graduates of this school receive practical experience as well as an academic training, they are able to secure employment as trained workers. The five majors offered are: Agricultural Business, Dairy Science, General Agriculture, Horticulture, and Poultry Science.

Students interested in this sort of training should request the catalogue of the Thompson School of Agriculture.

The College of Liberal Arts

The offerings of the College of Liberal Arts fall into three groups: (1) General Liberal Arts; (2) Business and Professional Training (except teaching); and (3) Teacher Preparation.

General Liberal Arts

The student in the General Liberal Arts curriculum can choose from a variety of offerings in the social sciences, the humanities, biological sciences, and physical sciences.

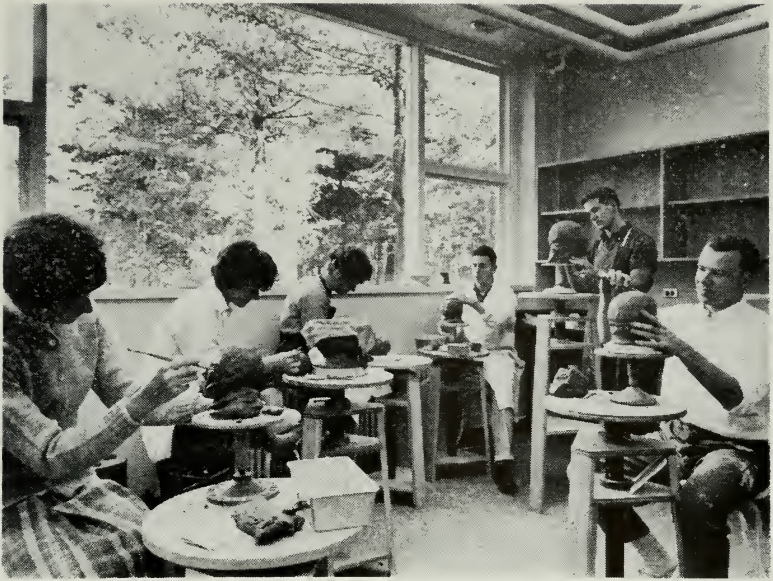
Each student who chooses the General Liberal Arts curriculum must pass a reading test in a foreign language before graduation from the University. Any questions on the nature of this test should be addressed to the Chairman of the Department of Languages.

A major may be taken in any of the following subjects: The Arts, Bacteriology, Biology, Botany, Chemistry, Economics, Education, English, Entomology, General Physical Science, Geology, Government, History, History and Literature, Foreign Languages, Mathematics, Music, Physics, Psychology, Sociology, or Zoology.

In his first year, a student following the General Liberal Arts curriculum will take, in addition to physical education and (if a male) military training, an introduction to contemporary civilization, freshman English, and either biology or a course in physical science chosen from chemistry, geology, mathematics, or physics. His fourth course is an elective. He may choose a course that permits him to explore some subject in which he has an interest.

The second year student in the General Liberal Arts curriculum will select broadly from the *Sophomore Group Requirements*. Courses must be taken in each of the following groups:

Group I	Group II	Group III
Introduction to The Arts	Biology	Economics
English Literature	Chemistry	Government
American Literature	Geology	Psychology
Humanities	Mathematics	Sociology
Foreign Languages	Physical Science	
Appreciation of Music	Physics	
Philosophy		



THE ARTS

The General Liberal Arts curriculum is intended to provide a concentration in a limited area but in no sense is it designed to prepare students completely for a specific vocation.

A student may choose a major at the end of his freshman year, or he may postpone his decision as late as the end of the sophomore year. A minimum of 24 semester credits is required in the major though some majors may require one or more additional courses which do not count for major credit.

Business and Professional Training

During the freshman year, students following one of the prescribed curricula take courses or have programs of courses very similar to those of students following the General Liberal Arts curriculum. The first year, those who are going into scientific fields usually take two sciences instead of one. In general, however, the work of the first year provides for breadth of experience rather than for the depth required in specialized training. Students following a prescribed curriculum are not held for the language reading requirement, but an attempt is made to enrich the curricula by including one year's work in both the Humanities and the Social Sciences. Required



MEDICAL TECHNOLOGY

courses in the various prescribed curricula in the sophomore, junior, and senior years include the courses listed. The balance of a student's program is made up of electives.

The prescribed curricula that prepare students for professional training and for certain vocations are: Business (with Accounting Option), Hotel Administration, Medical Technology, Nursing, Occupational Therapy, Pre-Medical, Secretarial, and Social Service.

Business — accounting, business communications, corporation finance, economics and business statistics, principles of economics, commercial law, marketing, public speaking, money and banking, business management, labor economics, plus two courses which must be elected from other offerings in the Department of Economics and Business Administration.

Students choosing the *Accounting Option* in the Business curriculum take all the foregoing courses except business management, labor economics, and the elective courses, but in addition must take intermediate accounting, cost accounting, advanced accounting, federal tax accounting, auditing, analysis of financial statements, and personnel administration.

Hotel Administration — chemistry for the freshman science, hotel orientation, elementary drafting, elementary accounting, hotel accounting, hotel engineering, hotel management lectures, hotel operation, principles of economics, commercial law, foods, quantity cookery, psychology, circuits and appliances, and heating and ventilating.

Medical Technology — chemistry and biology for freshman science, mathematics, quantitative analysis, organic chemistry, physiological chemistry, human anatomy-physiology, general bacteriology, pathogenic bacteriology, immunology and serology, and introductory physics.

Students in this curriculum spend six semesters on campus, then register for Biology 61-62 and complete one year under supervision in the laboratory at the Mary Hitchcock Memorial Hospital in Hanover, New Hampshire.

When all the requirements for the B.S. degree have been completed, the student will normally also be prepared for the "Medical Technologist" examination for certification.

Nursing — chemistry and biology for the freshman science, human anatomy-physiology, histology and microtechnique, and organic chemistry.

Three years on campus are followed by a three-year training period in an approved hospital.

Occupational Therapy — biology for the freshman science, sociology, drawing and design, crafts, ceramics-modeling and puppetry, general psychology, mental hygiene, developmental psychology, psychopathology, human anatomy-physiology, lettering and printing, theory of occupational therapy, elementary processes in wood and plastics, clinical subjects, neurology, and kinesiology.

Students planning on this curriculum must take a series of examinations preceding the sophomore year. The results of these will be used in advising the student whether or not he or she may continue in the curriculum.

Pre-Medical — chemistry and mathematics for freshman sciences, biology, general zoology and comparative anatomy, qualitative analysis, physics, organic chemistry, social science, humanities and language.

Secretarial — introduction to business, shorthand, typing, filing, office machines, office procedure and practice, business writing, U. S. economic development, accounting, and commercial law.

Social Service — biology for freshman science, general psychology, mental hygiene, public health and sanitation, social psychology, urban sociology, crime in American society, marriage and the family, introduction to social welfare, methods of social research, social welfare field experience and one course selected from an approved list in botany, entomology, and zoology.

Teacher Preparation — Secondary

Students may prepare for teaching in the secondary schools of New Hampshire and neighboring states either in a General Liberal Arts major or in one of the specialized teacher preparation curricula.

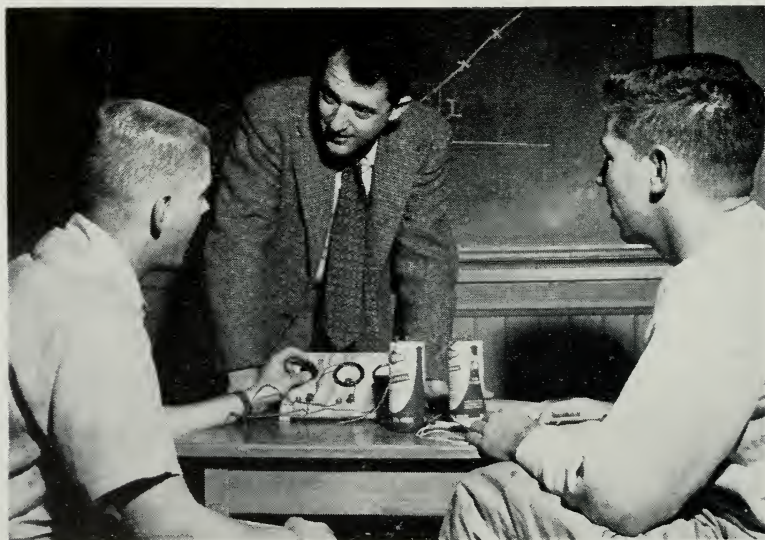
Usually only those who have objectives which can be met in no other way will be majors in the Department of Education. Most of those planning to teach in the secondary schools will major in a particular subject-matter area such as Biology, English, Government, History, Languages, Mathematics. Professional courses in Education required for state certification are taken as electives while completing the requirements for the Bachelor of Arts degree.

Those students who are interested in the specialized areas of Art, Music, or Physical Education may complete the requirements for the Bachelor of Science degree in one of the following prescribed curricula.

All these curricula include educational psychology, principles of American secondary education, supervised teaching, and planning for teaching in high school.* Other courses are included as shown.

* Planning for teaching in the high school is not included in Women's Physical Education.

PHYSICAL SCIENCE



Art Education — basic design, drawing and design, ceramics, advanced drawing and painting, graphic arts, commercial design, introduction to the arts, stagecraft, home decoration, history of costume, crafts, advanced painting and composition, and problems of teaching art.

Music Education — sight singing, ear training and dictation, harmony, introduction to music literature, applied music, music organizations, principles of conducting, problems of teaching elementary school music, French, German, or Italian, teaching of brass, percussion, strings, and woodwinds, orchestration and chorestration, and problems of teaching secondary school music.

Physical Education Teacher Preparation for Men — major teaching subject, minor teaching subject, principles of physical education, human anatomy-physiology, directed teaching in physical education, problems of teaching in physical education, problems of coaching, and administration of physical education.

Physical Education Teacher Preparation for Women — principles of physical education, human anatomy-physiology, recreation leadership, survey of dance, health education, theory of team sports, kinesiology, remedial gymnastics, administration of physical education for women, theory of individual sports, problems of teaching physical education for women, and directed teaching of physical education for women.

Students who desire to prepare themselves as playground directors, etc., may elect to follow the *Recreation Option*. In the junior and senior years this option substitutes for certain courses in the Physical Education Teacher Preparation program the following: stagecraft, crafts, dramatics workshop, organized camping, woodcraft, introduction to music literature, social psychology, an additional elective in the humanities plus recreation field work.

Other Opportunities

Students who intend to study dentistry, law or library science are advised to obtain a baccalaureate degree before beginning their professional training. The offerings of the College of Liberal Arts can usually be combined to satisfy the needs of students with these or similar objectives.



CHEMISTRY

The College of Technology

The College of Technology offers integrated programs of study in the areas of engineering, physical sciences, and mathematics. The Bachelor of Science degree is awarded after successful completion of specific curricula in Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering, Mathematics, Mechanical Engineering, and Physics. While mathematics and the physical sciences form the core of each of these curricula, work in the humanistic-social and life science areas is also either required or available as electives, since the College feels that a knowledge of the social structure in which the professional-scientific effort is to be used is vitally important.

The freshman year for all students in the College of Technology is common for all curricula and while students are asked to elect a departmental area for advisory purposes, it is possible to transfer to other curricula without loss of credit or time during the year.

Specific courses during the first year include mathematics, English, general chemistry, engineering drawing, physics, and a course in the humanities.

In the sophomore year all Technology students continue their studies in mathematics, including differential equations and physics. The curricula of all departments include also the opportunity for an elective sequence in the humanistic-social area. Engineering students further add to their core of basic courses, statics and dynamics of mechanics, fluid mechanics, and thermodynamics.

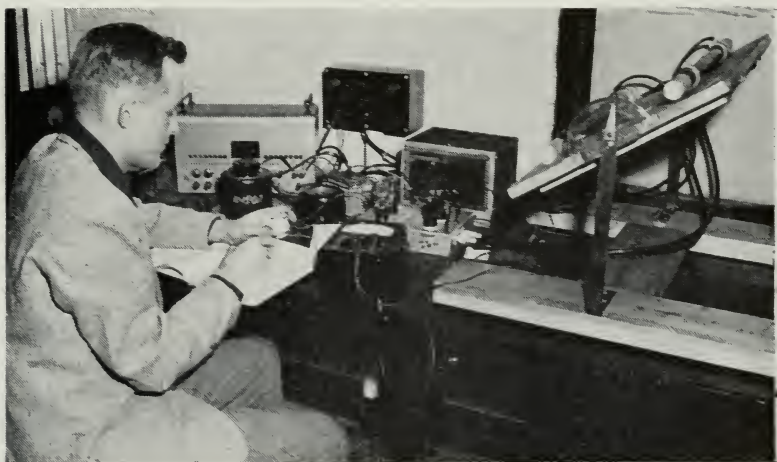
The junior and senior years provide further sequence opportunities in humanistic social studies and also include:

Chemical Engineering — quantitative analysis, organic chemistry, physical chemistry, chemical engineering principles, chemical engineering economics and plant design, chemical engineering thermodynamics, metallography, chemical engineering project, and fundamentals of electrical engineering.

Chemistry — organic and inorganic chemistry, analytical chemistry, physical chemistry, German, and a study of chemical literature. A thesis is required.

Civil Engineering — surveying, strength of materials, engineering materials, theory of determinate and indeterminate structures, steel design, electrical engineering fundamentals, general geology, highway engineering and transportation, soil mechanics, reinforced concrete design, structural engineering, hydraulic and sanitary engineering.

PHYSICS



Electrical Engineering — electromagnetics, electric circuits and networks, electronics, control systems and servomechanisms, engineering materials, mechanical laboratory, fields, engineering economics.

Mathematics — mathematical statistics, advanced calculus, higher algebra, mathematical analysis, differential geometry, topology, theory of differential equations, French, and German.

Mechanical Engineering — manufacturing processes and design, electrical engineering, engineering materials, mechanical laboratory, engineering materials, machine design and analysis, heat and power systems, engineering economics.

Physics — advanced calculus, physical mechanics, electricity and magnetism, experimental physics, atomic physics, nuclear physics, and theoretical physics, German.

All curricula in the College of Technology also provide opportunities for technical elective courses selected from the major field of study of the student or from other departments in the College of Technology or of the other colleges of the University. Other elective courses must be chosen from the social-humanistic fields.

All departments also offer the superior student an opportunity to participate in an Honors Program. This program allows the student working with his adviser to create a course of study emphasizing advanced work in some selected area or areas allied to his professional choice. Admission is by invitation of the department with the consent of the Dean of the College.

Other Programs of Study

The Graduate School

The Graduate School has offered instruction since 1903, with the objective of bringing together faculty and qualified students in a spirit of scholarship and research. The graduate student is given opportunity to specialize in some field of knowledge, and to develop a maturity of thought and attitude toward his professional field, so that both his professional and his cultural life are enhanced. The Faculty of the Graduate School is drawn from the regular departmental staffs in all three Colleges of the University.

The Dean of the Graduate School is responsible for the administration of the regulations and requirements pertaining to admission, conduct of work, the granting of advanced degrees, and other pertinent matters.

Programs leading to the Master's degree are available in the following disciplines: Agricultural Economics, Agricultural Education, Agronomy, Animal Science, Bacteriology, Biochemistry, Biology, Botany, Chemical Engineering, Chemistry, Civil Engineering, Dairy Science, Electrical Engineering, Entomology, Forestry, Home Economics, Horticulture, Mathematics, Mechanical Engineering, Physics, Poultry Science, and Zoology leading to the Master of Science degree; Economics, English, Government, History, Languages, Mathematics, Psychology, and Sociology leading to the Master of Arts degree; and Education leading to the Master of Education degree. A Master of Science degree for Teachers is also available.

Programs leading to the Doctor of Philosophy degree are offered in Botany, Chemistry, Horticulture, and Zoology.

Graduate assistantships are available in a number of departments. The work required may be in the nature of research, teaching, or general service. For information regarding assistantships, one should direct inquiries to the chairman of the department concerned.

Tuition scholarships are available for as many as twenty superior graduate students each semester. Application forms and other pertinent information may be obtained from the Dean of Graduate School.

For a Graduate School catalogue or detailed information concerning admission, requirements for degrees, description of courses open to graduate students, and other matters not covered above, write to the Dean of the Graduate School.

The Summer Session

The Summer Session is an integral part of the University program. Courses are offered by the three Colleges and the Graduate School to meet the needs of teachers, administrators, and supervisors of elementary and secondary schools; students who seek special professional preparation or are working for undergraduate or graduate degrees; students who anticipate courses or are supplying deficiencies; qualified and mature persons who wish to take courses for general cultural purposes. Qualified instructors are drawn from the University faculty and are supplemented by specialists selected for their attainments in particular fields at other institutions. The catalogue of the Summer Session gives specific information as to courses.

In addition to the offerings available at the University in Durham, summer instruction is given in Forestry and Fish and Game Management at the Forestry Summer Camp.

Reserve Officers Training Corps

In cooperation with the Federal Government, the University maintains a Reserve Officer Training Corps as a part of the federal system to provide trained reserve officers for the military services. There are Army and Air Force units.

While the Federal Government supervises the training, details officers and non-commissioned officers as instructors, and provides the necessary equipment, students who are members of the ROTC are in no way members of the military forces. Under the present provisions of the National Selective Service Act, certain qualified students may, upon signing a deferment agreement, be deferred from induction into the armed forces during the period of enrollment in the ROTC. Students signing a deferment agreement consent to enroll in the advanced course (junior and senior years), if offered the opportunity. Those enrolling in the advanced course agree to attend ROTC summer camp and to complete the course of instruction as a prerequisite to graduation. Those in the advanced course receive a monetary subsistence allowance of about \$275 per academic year.

Students enrolled in the ROTC will be furnished uniforms which are worn during military instruction, when prescribed. A deposit of \$15 is required of each student having military clothing or equipment in his possession. This deposit is returned when the student completes his ROTC instruction, except that a reasonable deduction will be made to cover loss or any unusual wear. Those completing the advanced course are allowed to keep their uniforms.

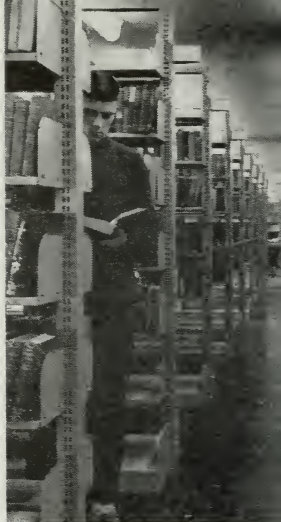
Transfer students (at the junior and senior class level) and freshmen entering with previous military training should consult the ROTC officers regarding the possibility of qualifying for enrollment.

Students satisfactorily completing the advanced course are, upon graduation, ordinarily commissioned as reserve second lieutenants. Students designated as Distinguished Military Students during the second year of the Army advanced course are eligible to apply for direct appointments as commissioned officers in the Regular Army.

Students designated as Distinguished Air Force ROTC cadets during the second year of the Air Force advanced course are eligible to apply for direct appointment as commissioned officers in the Regular Air Force.



CONCERT CHOIR



UNIVERSITY LIBRARY

Cultural Opportunities

As important as the classrooms and laboratories may be, a great University would be incomplete without cultural activities outside the regular program of instruction. The University conducts a number of cultural functions, both for the benefit of students and faculty and for the people of the state.

The center of the University's cultural life is the Library where there are 286,366 books and a collection of more than 2,400 phonograph records. The Library has a branch for plant and animal sciences in Nesmith Hall, and one for chemistry in James Hall, and an engineering reading room in Kingsbury Hall. The Library is a U. S. Government Depository Library. In the fall of 1958, the Library moved into a new \$1,400,000 building.

The University has several collections housed in various buildings. They include one which illustrates the zoology, geology, entomology, and Americana of New Hampshire; one devoted to more than 500 costumes dating from Revolutionary times; another to fabrics; an extensive china and glass collection; a bird collection; and one devoted to testing machinery used by a New Hampshire professor more than 50 years ago when he developed what is known as the Kingsbury thrust bearing.

An outstanding cultural program in music includes a number of concerts by student vocal and instrumental groups and recitals by

several talented faculty members. In this same field the University sponsors a special concert series each year which brings professional musicians to the campus from the nation's opera and symphony halls. Regular concerts are played from a 64-bell electronic carillon from the tower of Thompson Hall. The carillon, installed in 1952, is a memorial to the late registrar, Oren V. Henderson.

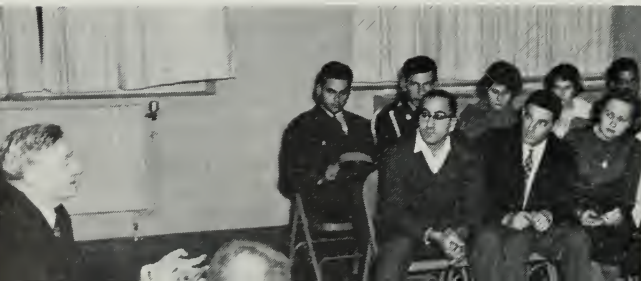
Drama is offered several times during the year by capable student groups. The new theatre in the Paul Creative Arts Center has been described by an authority as one of the best in the East.

There are many public lectures, both by faculty and off-campus speakers. A Distinguished Lecture Series brings outstanding men of arts, letters, science, and the humanities to the campus every year. These individuals lecture, meet with classes, and talk informally to student and faculty groups. Recent lecturers have been Margaret Meade, anthropologist; Aaron Copland, American composer; Oliver Carmichael, Consultant to the Fund for the Advancement of Education; Fred Hoyle, Cambridge University astronomer; and Associate Justice William O. Douglas of the U. S. Supreme Court.

Alumni, through their annual fund, support an Alumni Visitor program. The first Visitor was Dr. Edmund W. Sinnott, eminent botanist and retired Dean of the Yale Graduate School, who spent a semester on campus as a lecturer-in-residence. Other Alumni Visitors have been Clement Atlee, former Prime Minister of Great Britain; Paul Henri Spaak, Secretary General of NATO; Henry Cabot Lodge, U. S. Representative to the United Nations; Clinton L. Rossiter, sociologist; Norman Cousins, Editor of the *Saturday Review*; Prof. Norbert Wiener, M.I.T. mathematician; and Earl McGrath, former U. S. Commissioner of Education.

The Department of The Arts presents a continuously changing program of exhibitions, which are selected to appeal to a variety of interests. These exhibitions are shown in the University Gallery in the Paul Creative Arts Center and in the Exhibition Corridor at Hewitt Hall.

JUSTICE DOUGLAS, DISTINGUISHED LECTURER



Methods of Admission

Regular Students

The University will admit properly prepared New Hampshire students who are graduates of high schools or academies of New Hampshire which are approved by the State Board of Education, or those who are graduates of other accredited preparatory schools.

All applicants are required to submit the College Entrance Board Scholastic Aptitude test results for a test taken during the senior year. The December, January, or February series are preferred.

In-state applicants must have a scholastic record ranking in the upper two-fifths of the graduating class, be recommended and/or certified, and have appropriate college preparatory background, in order to be eligible for admission.

The number of out-of-state students admitted each year is limited. Selection of out-of-state candidates is made primarily on the basis of superior academic achievement in secondary school, but such traits as character, leadership, and initiative will be taken into account.

Under the Regional Cooperation Program of the New England Board of Higher Education, after qualified New Hampshire residents are accommodated, students from other New England states are given priority in certain curricula. In specified classes, from some states, students in these curricula are charged in-state tuition, as follows: in Occupational Therapy, sophomores, juniors, and seniors from all New England; in Hotel Administration, juniors and seniors from Maine, Massachusetts, Rhode Island, and Vermont; in Art and Art-Education, juniors and seniors from Maine, Rhode Island, and Vermont; in Physical Education for Women, juniors and seniors from Rhode Island and Vermont.

Applicants for admission to the University are required to fill out formal application papers obtained from secondary-school officials in New Hampshire or from the Director of Admissions.



CLASS ON THE LAWN

Applicants for admission who are residents of New Hampshire are required to remit a tuition deposit of \$15 with their applications. Applicants from outside the state are required to remit \$40. The advance payment is applied to the first semester's tuition in the case of accepted applicants. Advance payments are returned if an applicant is not admitted. The tuition deposit will not be returned in the event an applicant is accepted for admission but either does not enter or withdraws after being accepted. Remittance should be made either by check or by money order payable directly to the University of New Hampshire and should be sent with the application for admission.

Applications for admission in September should not be made until a student has received grades for the first ranking period of the senior year in high school. To insure consideration before the out-of-state quota is filled, out-of-state students should file applications not later than the middle of March. To insure eligibility for financial aid and a choice of residence hall rooms, in-state students should apply no later than the spring. It is understood that the preparatory work of students applying during the year will be completed successfully by the end of the school year. *No application will be considered which is not complete at least one week before the start of Orientation.*

It is recommended that students obtain the strongest possible academic preparation by taking a regular and full college preparatory

program of 16 units, including English, mathematics, foreign language, natural science, and social science.

An entrance unit represents one course of four or five recitations a week for one year.

While 16 units of college preparatory work are recommended, the University will accept 12 in college preparatory subjects, including at least three units of English, one of natural science, and one in social science. *It should be recognized that these as well as the following specific subject requirements are the least acceptable rather than the most desirable.*

In addition to the English, natural science, and social science, specified above, students entering the *College of Agriculture* are required to present at least two units of college preparatory mathematics.

Students entering the *College of Liberal Arts* must present two units of a single foreign language and two units of college preparatory mathematics.

Students enrolling in the *College of Technology*, or electing agricultural engineering, must offer at least three and one-half units of mathematics including elementary and intermediate algebra, plane geometry, and trigonometry. Commercial arithmetic and shop mathematics are not classified as college-preparatory subjects.

Cases not covered by the above statements will be decided by the Committee on Admission.

Every candidate for admission claiming New Hampshire residence is required to complete a form which contains a statement to the effect that his parents are legally domiciled in the State of New Hampshire and that their names have appeared on the check list of the town or city of domicile for the entire past year. This statement must be notarized before an official authorized to administer oaths. *Students admitted from foreign countries or states other than New Hampshire shall be deemed to be non-resident students throughout their entire attendance at the University unless and until the parents (or the mature student) have gained bona fide residence in New Hampshire.*

Students admitted to the University must present to the Director of the University Health Service completed medical history and physical examination reports before registration can be completed. The forms for this report are furnished by the University.*

* Exemption from the requirements may be secured only through submission of a written statement from parent or guardian which indicates that the request is made because of religious beliefs.

Early Admission and Advanced Placement

Recognizing that there are differences in the learning capacities of college preparatory students, University admission policy provides for the early acceptance and admission of a limited number of students who show unusual promise. The University of New Hampshire does not actively recruit candidates for college entry before graduation from secondary school but, *upon the recommendation of the school*, will review the credentials of students whose academic programs have been unusually successful and extensive. Social and emotional maturity, in addition to superior academic achievement, is stressed in considering candidates for early admission or admission before the senior year.

Additionally, provision is made for recognition by means of advanced placement and credit for students who have taken especially enriched or accelerated courses in secondary school. Applicants qualify for course or academic credit by satisfactory achievement on approved placement examinations.

Further information may be obtained from the Director of Admissions.

Special Students

Under special circumstances individuals may be permitted to register for certain courses without having been admitted formally to the University. Normally these individuals are adults whose objective may be realized by taking one or two courses for a semester or two. Such individuals are designated as Special Students and are not considered to be working toward a degree at the University of New Hampshire.

Advanced Standing

Qualified candidates for advanced standing from approved institutions may be admitted. Their status is tentatively determined by the quantity and quality of the work completed at the institution from which they come.

In transfer, credits are allowable for courses which are appropriate to the curriculum for which the student is admitted and for courses in which grades above the lowest passing grade were received.

University admissions policy restricts consideration for transfer to those students with above average academic records as well as satisfactory personal records.

While the University is pleased to encourage the competent transfer applicant who has valid and legitimate reasons for desiring the transfer to New Hampshire, it cannot encourage the applicant with a history of academic or personal difficulty.

(1) Transfer students must file the same basic application for admission required of freshmen. In addition, they must furnish, at least 30 days prior to the time of transfer to the University of New Hampshire, an official transcript of work done at institutions previously attended.

(2) All candidates for the Bachelor's degree, admitted to advanced standing, must spend their last year in residence, either in course or in Summer Session. This requires the completion of at least a quarter of the credits required for the degree.

(3) Regardless of the amount of advanced standing a student may secure, in no case shall he be granted a Bachelor's degree until he has satisfied the full requirements of the curriculum he may elect.

Expenses

The tuition fee is \$380 per year for residents of New Hampshire and \$800* for non-residents. This charge is all-inclusive, covering registration, laboratory, health, graduation fees, and admission to all intercollegiate athletic events. However, refundable deposits may be required to cover loss or breakage in certain departments. A charge is made for individual lessons in music. In a few courses there is a charge for materials used in making articles kept by the student. Details will be found in the description of courses.

Any student registering for 8 credits or more per semester shall pay the full tuition. Any student registering for fewer than 8 credits shall pay \$17.50 per credit hour. This applies to both "Regular" and "Special" students.

The tuition for each semester is payable in advance. Students who find it difficult or impossible to procure the necessary funds for the full amount due for a semester may make arrangements acceptable to the Financial Aids Officer for a series of payments during a semester. In all cases one-third of the amount due must be paid before registration. There is a small fee for this deferred payment plan.

If a student withdraws from the University his tuition will be refunded as follows: if withdrawal is within four calendar days following his registration, three-fourths refund; after four calendar days and within thirty, one-half refund; after thirty calendar days, no refund.

CHANGES IN RATES — The University reserves the right to adjust charges for such items as tuition, board, and room rent from time to time. Such changes will be held to a minimum and will be announced as far in advance as feasible.

* For Regional Cooperation Program students see page 25.

Campus Map Legend

UNIVERSITY BUILDINGS

- Agronomy Field Station* (56).
- Alexander Hall* (1), men's residence.
- Alumni House* (71), offices of the Alumni Association.
- Athletic Facilities*, men's are at Lewis Fields (51); women's are at New Hampshire Hall (60) and Memorial Field (59).
- Batchelder Skating Rink* (61).
- Brackett Field* (51), varsity baseball.
- Commons* (4), University Dining Hall; University Conference Center; and offices of the University Extension Service, Summer Session, and Testing and Placement.
- Conant Hall* (23), Geology and Geography; Psychology.
- Congreve Hall* (65), women's residence.
- Cowell Stadium* (51), concrete stands with seats for 5,000.
- Dairy Barns* (57).
- Dairy Building* (15), Dairy Science.
- DeMeritt Hall* (12), Mathematics; Physics.
- East Hall* (5), men's residence.
- Engelhardt Hall* (28), men's residence.
- Elizabeth DeMeritt House* (75), Home Economics practice house.
- Faculty and Married Student Apartments* (46).
- Fairchild Hall* (3), men's residence.
- Fire Station* (19).
- Gibbs Hall* (30), men's residence.
- Greenhouses* (54).
- Hamilton Smith Hall* (8), Government; History; Hotel Administration; Sociology.
- Heating Plant* (18).
- Hetzel Hall* (2), men's residence.
- Hewitt Hall* (22), Audio-Visual Center; Photo Service; Mail Room; Printing Service; Student Workshop; Army and Air Force ROTC.
- Hitchcock Hall* (26), women's residence.
- Hood House* (7), out-patient clinic and infirmary for students.
- Hunter Hall* (29), men's residence.
- James Hall* (13), Chemistry.
- Kingsbury Hall* (47), Chemical, Civil, Electrical, and Mechanical Engineering; the Engineering Experiment Station; offices of the College of Technology.
- Lewis Fields* (51), athletic facilities for men.
- Livestock Barn* (52).
- Lord Hall* (63), women's residence.
- McLaughlin Hall* (64), women's residence.
- Memorial Field* (59), women's athletics.
- Memorial Union* (6), center for student activities and state conferences; cafeteria and snack bar; games rooms and bowling alleys; studios of WENH-TV.

(Continued on Page 34)



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100 0 100 200 300 400 500 600 700 800 900

SCALE IN FEET



Campus Map Legend

(Continued from Page 31)

UNIVERSITY BUILDINGS

Morrill Hall (14), Agricultural Economics; Economics and Business Administration; offices of the College of Agriculture and Agricultural Experiment Station.

Murkland Hall (11), English; Languages; Education.

Nesmith Hall (16), Agronomy; Animal Science; Botany; Entomology; Horticulture; Poultry Science.

New Hampshire Hall (60), women's athletics; religious activities offices; 1,000-seat hall for convocations, lectures, and concerts.

Nursery School (68).

Nutrition Barn (49).

Paul Creative Arts Center (25), The Arts; Music; Drama and Speech; theatre-recital hall with seating for 735; exhibition gallery; experimental arena theatre seating 100; offices of the College of Liberal Arts.

Pettee Hall (17), Home Economics; Agricultural Engineering; Forestry.

Pettee House (74), employee residence.

Poultry Plant (48).

President's House (72).

Putnam Hall (55), Thompson School of Agriculture; livestock and judging pavilion.

Randall Hall (26), women's residence.

Railroad Station (58), Boston & Maine.

Riding Stable (53).

Ritzman Nutrition Laboratory (50).

Sawyer Hall (69), women's residence.

Schofield House (73), graduate residence.

Scott Hall (66), women's residence.

Service Building (20).

Smith Hall (67), women's residence.

Spaulding Life Science Building (24), Bacteriology; Biochemistry; Zoology.

Swimming Pool (62).

Thompson Hall (9), administration building, including offices of Director of Admissions and Registrar; offices of Cooperative Extension Service and University Bookstore.

University Library (10).

West Hall (5), men's residence.

Fraternities

Acacia (A), Alpha Gamma Rho (K), Alpha Tau Omega (C), Kappa Sigma (B), Lambda Chi Alpha (E), Phi Delta Upsilon (L), Phi Mu Delta (R), Phi Sigma Delta (N), Pi Kappa Alpha (I), Sigma Alpha Epsilon (T), Sigma Beta (S), Tau Kappa Epsilon (J), Theta Chi (Q).

Sororities

Alpha Chi Omega (H), Alpha Xi Delta (F), Chi Omega (O), Kappa Delta (G), Phi Mu (M), Theta Upsilon (P).

Estimate of Average Freshman Expenses 32 Weeks

<i>University Expenses*</i>		<i>Personal Expenses</i>	
Tuition and		Clothing	\$50
Fees	\$380 (800)	Laundry	25
Activity charge	25	Medical care	20
Room	230	Recreation	30
Board†	310	Incidentals	35
Books	75	Travel	25 (50)
Sub-Total		Sub-Total	\$185 (210)
		TOTAL	\$1,205 (1,650)

* These are direct University expenses which are the primary costs of a college education to all students. Figures in parentheses are for non-residents of New Hampshire.

† This item is subject to adjustment as food prices change.

ADVANCE TUITION PAYMENT — An applicant for admission who is a resident of New Hampshire is required to remit \$15 with his application; one from outside the State is required to remit \$40. If the applicant is admitted to the University, his advance payment will be applied to the first semester's tuition; if he is not admitted, his advance payment will be returned. The advance payment of a student who is admitted, but does not enter, will not be returned.

MILITARY DEPOSIT — Uniforms for members of the Reserve Officers Training Corps are provided in cooperation with the Federal Government. A deposit of \$15 is required of each student to whom military equipment is issued and is refundable, minus cost of lost or damaged articles, at the time of returning military equipment.

ATHLETIC LOCKER DEPOSIT — Every student participating in the programs of Physical Education and Athletics for Men and Physical Education for Women is required to pay \$1.00 for locker and towel service.

ACTIVITY CHARGE — The Activity Tax, authorized by vote of the Student Senate with the approval of the Board of Trustees, must be paid by each undergraduate at the time of registration. The revenue from the tax provides each student with *The New Hampshire*, student newspaper; *The Granite*, University annual; Student Union membership, Student Government membership, and class activities. In 1961-1962 this tax will be about \$10.

In addition there is a \$12 Memorial Union assessment, which must be paid by both undergraduate and graduate students.



BOOKS — Students may purchase books, classroom supplies, and other supplies at the University Bookstore.

LIVING ACCOMMODATIONS — The University has nine residence halls for women and seven for men. With the exception of those living at home, all undergraduate women are required to live in University residence halls or sorority houses unless granted special permission by an Associate Dean of Students. Undergraduate men are not required to live in residence halls, but will be accommodated to the extent of the living space available. Rooms in private homes may be secured for prices somewhat above those in University residence halls. All rooms in University residence halls are heated, lighted, and furnished. Bed linen, blankets, towels, and desk lamps, however, are provided by the individual student. A house director is in charge of each residence hall. Information regarding rental linen service which includes towels, blankets, sheets, and pillow cases will be sent at a later date. Automatic washing machines and dryers are available for all residence halls. A service room is provided in each hall where University grills and irons may be used with safety.

Housing application and contract forms will be sent to freshmen and transfer students at the time of official admission to the University by the Director of Admissions. Preference in the assignment of rooms will be determined by the receipt of the housing application and contract form at the Office of University Housing, Thompson Hall. Students requesting single rooms will be assigned to double rooms if no singles are available. They will, however, be placed on a waiting list to be automatically assigned to single rooms as they become available. Roommate requests can be honored only when both housing applications are sent in the same envelope.

Students reserving rooms in University residence halls are obligated for the entire academic year.

A ten-dollar (\$10.00) room deposit must accompany each application, this deposit to be forfeited if the room accepted is not occupied by the applicant. Make checks payable to the University of New Hampshire. (*Do not send cash.*) Upon official termination of occupancy and the surrender of the room key to the house director, the deposit, less accumulated charges, will be refunded. The room deposit is subject to forfeiture if the student vacates his room without checking out properly.

Room rent is payable in advance. For those entering in Semester I, the rent must be paid by the deadline date stated on the room bill, which is usually August 15. Late assignments will have an adjusted date for payment. Those entering in Semester II must pay room rents no later than the last business day before the start of

University Undergraduate Residence Halls*

Hall	Date Built	Number of Rooms			Rent per Student per Year†	
		Single	Double	Suites or Triple	Single or Suite	Double or Triple
<i>Men</i>						
Alexander	1951	10	63	—	\$270.00	\$240.00
East-West‡	1918	—	107	—	—	165.00
Engelhardt	1946	19	46	—	225.00	195.00
Fairchild	1916§	47	29	11	260.00	230.00
Gibbs	1946	19	46	—	225.00	195.00
Hetzel	1925	28	38	21	260.00	230.00
Hunter	1946	19	46	—	225.00	195.00
<i>Women</i>						
Congreve North	1940	67	9	—	265.00	235.00
Congreve South	1920	56	44	5	255.00	225.00
Hitchcock	1959	21	67	—	280.00	250.00
Lord	1957	7	54	—	270.00	240.00
McLaughlin	1954	19	51	—	270.00	240.00
Randall	1959	10	74	—	280.00	250.00
Sawyer	1951	4	60	—	270.00	240.00
Scott	1932	46	33	—	250.00	230.00
Smith*	1908	10	29	2 Quad. 2 Triples	210.00	180.00

* Residence halls may be changed to accommodate men or women as is needed, depending on enrollment.

† If, on a date to be announced (approximately 30 days after the start of a semester), one student is occupying a double room alone he will be charged \$20 extra for the semester. A student wishing to avoid this charge must inform his house director he wants reassignment. If on this same date a room is necessarily occupied above normal capacity, each occupant will receive a rebate of 20 percent for the number of days occupied as a converted triple for Semester I. This rebate will be applied to the room rent charge for Semester II.

‡ Frame construction: Smith is brick veneered. All other residence halls are fire-resistant.

§ Renovated in 1951.

classes. Reserved rooms will be held only until August 15. Unless payments have been received or specific arrangements made by the deadline date, the room reservation will be cancelled and reassigned to the next person on the waiting list.

Rooms paid for and not occupied one day after registration may be declared vacant and the room rent returned, unless the individual holding the reservation makes a written request to the Manager of University Housing to hold the room until a later date. (No room will be reserved for more than ten days after the registration date.) The advance payment for the room will not be returned to those making such special request if the room is not occupied by the applicant. No refunds of room rent will be made to students enrolled and attending the University where a room reser-

vation has been made but the room is not occupied by the applicant. *The housing contract is for the entire academic year.*

If a student occupies a room and then withdraws from the University, his room rent will be refunded as follows: if withdrawal is within four calendar days following his registration, three-fourths; after four calendar days and within thirty, one-half refund; after thirty calendar days, no refund.

Two women's residence halls, Lord and Smith, are on the social honor system. This system is essentially a plan whereby more responsibility is accepted by the residents for the government of the dormitory. The rules which govern Lord and Smith Halls are the same rules that are in effect in other halls. A student who lives in either of these two halls is asked to sign an honor pledge indicating her willingness to live by the established rules. Residents are pledged to report their own infractions of rules and to encourage similar action on the part of others. Freshman women are permitted to live in an honor hall provided they are willing to assume the responsibility of the honor system that the upperclass residents assume.

The University operates 98 apartments for Faculty and married students. For further information write the Manager of University Housing.

BOARD — Dining Halls are operated and supervised by the University for the accommodation and benefit of the student. All freshmen, except those whose rooms and meals are provided at home or who are working for their meals, are required to board at the Commons Dining Hall for the first two semesters of attendance at the University. The aim of this regulation is to insure a broad fellowship and to safeguard the health of the first-year students by offering skilled dietetic supervision in selection and preparation of their food. The dining halls are equipped with the best appliances for cooking and serving on a large scale, and are subject to constant sanitary inspection by the University Physician. Board in the Freshman Dining Hall in 1960-1961 was \$155 per semester. An increase in 1961-1962 is anticipated.

Cafeterias in the Commons and the Memorial Union are open to all students of the upper classes who may desire to take advantage of the moderate price and the high quality of food available. In the Commons cafeteria in 1960-1961, 21-meal weekly tickets were \$12.

PERSONAL CASH DEPOSIT — Students are urged to arrange personal checking accounts, or to place money on deposit in the Business Office until needed, in order to avoid possible loss resulting from keeping on hand considerable sums of money. Such banking arrangements will also facilitate payment at registration periods. The Business Office will accept and cash student checks.

Financial Aid For Students

The parents of many students at the University may find it a burden to bear the entire cost of four years of college education. This situation frequently is relieved in one or more of three ways: the student may help by working during the summer and in his spare time during the college year; the University or other organizations may grant a scholarship; the student may apply for a loan from the University Loan Fund or from the National Defense Student Loan Program. Before a loan is granted, the student must substantiate his need for the loan to the satisfaction of the Financial Aids Committee. A bulletin describing in detail ways of financing an education at the University of New Hampshire has been prepared. A student with financial problems should request this bulletin, *Financial Aids*. Included in the bulletin is a list of all University of New Hampshire scholarships.

STUDENT WORK — During the college year, some students may work as library assistants, assistants in instructional or research laboratories, counselors in dormitories, clerks in offices, workers in the dining halls, student janitors, and student workers on the University farms and about the campus. Others work in fraternities, sororities, and in stores and households in the community.

A student in good health and of good academic ability should be able to earn between \$150-\$300 by working about 10 to 15 hours a week during the college year.

There are a few opportunities, usually for women students, to work in private homes in exchange for room and board. Freshmen are advised against attempting to earn their room and board in this way unless they are in good physical condition, have had excellent preparation for college, and will find it impossible to attend college otherwise.

SCHOLARSHIPS — About 1,000 scholarships are awarded each year through the University Financial Aids Committee. Many of these are open to freshmen.

The total annual value of the scholarships and tuition grants is more than \$175,000. The majority of awards fall within the \$100-\$300 range with amounts in excess of \$300 going to exceptional candidates in terms of need, academic ability, and extra-curricular participation. The average award is about \$200. Most of the scholarships are awarded to students with better than average scholastic records and a definite need for financial assistance. A few are awarded solely on the basis of outstanding accomplishment, while a number are awarded primarily on the basis of financial need. In

addition to the scholarships offered by the University, there are scholarships in many communities for high school graduates who are planning college study. These usually are awarded by a local service or women's club or by a trust fund. High school principals and local banks frequently have information about such funds. Applicants for admission who live in New Hampshire may obtain scholarship information from their high-school principals, guidance counselors or the University Financial Aids Officer. The latter official is trained to help with advice and plans for financing college education. Students with special financial problems should contact her.

Applications by upperclassmen for scholarships, and applications for renewal of awards, should be filed by April 1 of the year preceding that for which the scholarship is sought. Applications by prospective freshmen should be made by May 1.

STUDENT LOANS — In order to assist students to continue their education, the University has a Loan Fund. After proper investigation, and approval by parents, loans may be granted to students for tuition or other college expenses.

The Federal Government has authorized a Student Loan Program. The University of New Hampshire participates in this program.

Before any loan is authorized a student must prove to the satisfaction of the Financial Aids Committee that a loan is necessary to meet college expenses.





Student Life on Campus

Student Personnel Services

University responsibilities for student activities and welfare outside the formal academic organization are coordinated through the Division of Student Personnel. The activities in this area include supervision of student health, counseling, living arrangements, employment service, scholarships and loans, maintenance of academic standards, and protection of personal standards of conduct.

A student is held responsible for such rules and regulations as may be established by the University Senate, and he also must meet such new regulations as may be adopted subsequently by the University and made applicable to him.

The Dean of Students is responsible for the Division of Student Personnel. The following administrative officers are concerned with the operation of the Division:

Charles M. Wheeler, Jr., *Acting Dean of Students*; Elizabeth A. McQuade and Robb G. Gardiner, *Associate Deans of Students*; Charles H. Howarth, M.D., *Director, University Health Service*; William D. Crandall, M.D., *Assistant Director, University Health Service*; Paul E. Schaefer, *Registrar*; Harry R. Carroll, *Director of Admissions*; Alfred T. Quirk, *Assistant Director of Admissions*; Jane B. Stearns, *Financial Aids Officer*; Paul H. McIntire, *Director of Testing and Placement*; Kathleen R. Beckingham, *Counselor*; Frederick M. Jervis, *Director of Counseling* (on leave 1960-61); Robert G. Congdon, *Counselor* (*Acting Director of Counseling*); Eleanor I. Kay, *Psychologist*; William W. Lothrop, *Psychologist*; Herbert A. Carroll, Walter R. Duryea, *Consulting Clinical Psychologists*; Gerhard S. Nothmann, M.D., *Consulting Psychiatrist*; C. Robert Keesey, *Director, Memorial Union*; John E. Ewart, *Program Director, Memorial Union*; Harriet B. Nason, *Supervising Nurse*.

Associate Deans of Students

The Associate Deans of Students share responsibility for the supervision of activities of all students at the University. This includes responsibility for the administration of University rules and the coordination of group activities. All social affairs requiring chaperonage are reviewed in the Office of the Associate Deans.

The Associate Deans work closely with the other personnel agencies on campus, with the various colleges of the University, and with the residence halls and fraternities and sororities in order to encourage each student to take fullest advantage of his college experience. Students having questions about any phase of college life are encouraged to discuss them with one of the Associate Deans.

An Orientation program was instituted at the University in 1924. Its purpose is to introduce new students to the University, its history and its traditions, and to help them to adjust rapidly and effectively to college life. During this period new students complete their program planning and registration and get to know faculty and fellow students. Because of the proved importance of Orientation activities, all new students are required to be in attendance.

Admissions Office

The function of the Admissions Office is to contact prospective college students, to process their applications, to correspond with them, to distribute bulletins and catalogues, and finally, to select students. The Admissions Office is located in Thompson Hall.

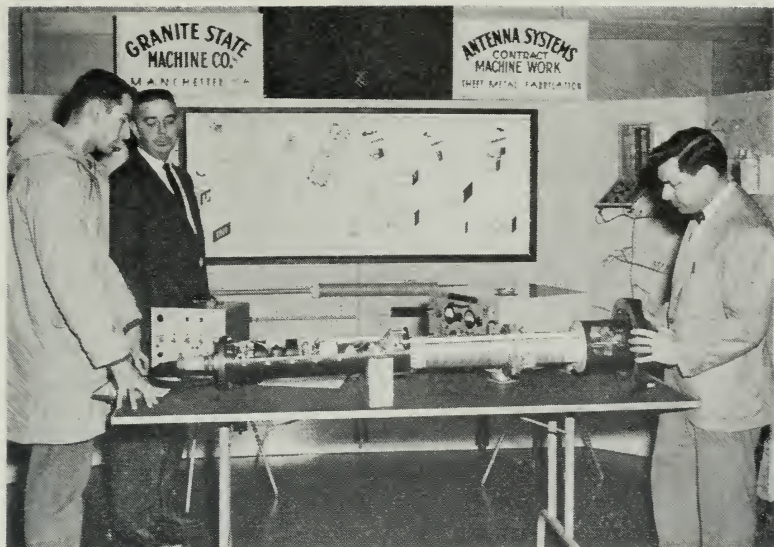
Testing and Placement Service

The Testing and Placement Service is essentially the University's bureau of vocational services. In fulfilling its placement function, the service assists seniors and University graduates in securing positions commensurate with their training and experience through contacts with prospective employers. The service's testing functions include admission and orientation testing, national testing programs such as the Graduate Record Examination, and individual testing for guidance purposes.

Services to the state in the area of testing include a Cooperative Guidance Testing Program, the High School Sophomore Survey, testing for high school equivalency, and consulting, rental, scoring, and other technical services to the public schools of New Hampshire.

Registrar's Office

The Registrar's Office conducts registration, maintains the academic records, issue grades and transcripts, checks the students' records, and makes up the student directory, Commencement lists and honor



PLACEMENT FOR SENIORS

rolls. It is closely allied to the Admissions Office and prepares the student's advisory record after formal admission. Routine contacts with the Veterans Administration regarding educational benefits are handled by this office as well as certification of a veteran's enrollment and the processing of the veteran's monthly report. The Registrar is the Secretary of the Commencement Committee, the Committee on Scholastic Standing, and the University Senate.

Counseling Service

The Counseling Service, without cost, assists students in self-evaluation, and in the development of sound plans and objectives. Personal counsel and guidance are offered to those students facing problems of emotional and social adjustment.

Health Service

The University Health Service, located in Hood House, is devoted to the protection, improvement, and maintenance of student health. A well-equipped out-patient clinic for diagnosis and treatment of ambulatory patients and a modern hospital of 26 beds, with private and semi-private rooms, wards, and an isolation division for communicable diseases, are constantly available for students who require medical or surgical care. Registered nurses are on duty at all times. In-

dividual health guidance is given through personal conferences with the University physicians.

Payment of tuition entitles students to all medical care rendered by the University Physician and his staff. Injury and illness which require hospital confinement other than in Hood House, services of specialists, operations, ambulance service, special nurse, or special prescriptions are at the expense of the student. Bed patients at Hood House are charged \$3.00 per day. Office hours of the University Physician are from 8:00 A.M. to 4:30 P.M. daily except Saturdays and Sundays.

Student's Medical Reimbursement Insurance

In addition to the health service available through Hood House, group accident and sickness insurance giving 12 months' coverage is available to students at the University. This insurance coverage is designed to supplement the program of the University. Complete details will be sent each student with his first semester bill.

Memorial Union

The University's new Memorial Union, which began operations in the fall of 1957, has become a community center for students. The Memorial Union was designed to fulfill three functions on the UNH campus: a living memorial to the men and women of the State of



MEMORIAL UNION

New Hampshire who have served in our armed forces, a college union, and a state-wide conference center. With its extensive and well-planned facilities, it serves as a focus for all extra-curricular activities on the campus.

In addition to its meeting and conference rooms, lounges, music listening and TV rooms, cafeteria, snack bar, games area for table tennis, billiards, and bowling, and its spacious Strafford Room utilized for a variety of social functions, the Union provides permanent headquarters for several major student organizations.

The facilities of the Memorial Union are effectively adapted to the recreational needs of the campus by a well-rounded, leisure-time program of social and cultural activities planned by the various student committees of Student Union.

Religious Activities

Opportunities are provided in Durham for students to practice religion and to participate in religious life. The Hillel Foundation, the Newman Club, the Christian Science Organization, the Phanarion Society, and the United Protestant Association which includes Canterbury Club, Christian Association, Channing-Murray Club, and Inter-Varsity Christian Fellowship, are the agencies through which the religious interests and life are fostered among the students.

The Durham Community Church welcomes students to its Sunday services of worship, 9:15 and 11:00 A.M., and to share church activities through student affiliate membership.

The needs of Episcopal students are met by a chaplain who is also rector at St. George's Church. Services are held on Sundays at 8:30 and 10:30 A.M. and 6:00 P.M.

The parish of St. Thomas More serves Roman Catholic members of the community. Sunday Masses are held at 8:00, 10:30, and 11:30 A.M.

Financial Aids Office

The Financial Aids office tries to assist students in making financial arrangements for college. It processes applications for student loans, scholarships, and deferred tuition payments. Assistance also is given students in finding part-time employment during the college year and full-time employment during the summer vacations. This office also administers the Federal Student Loan Program. A financial aids bulletin, giving full details, is available.

Military Service Affairs

An Associate Dean of Students has been designated as the Administrator of Military Service Affairs for the University. In this capaci-

ty, he is the representative of the University in all matters concerning the Selective Service System and the branches of the Armed Forces. The Administrator acts in an advisory capacity to all students who have questions concerning military service. Students reaching their eighteenth birthday may complete the registration for Selective Service in his office.

Student Government

All undergraduate students are members of the "Student Government of the University of New Hampshire". The purposes of Student Government include promoting individual and collective responsibility among students, coordinating the activities of the student body and the faculty, and acting as the official representative body for the students. The work of the Student Government is carried on by the Student Senate, the members of which are elected to represent all housing units and the commuting students.

Subsidiary organizations include, in addition to the class organizations, Women's Inter-Dormitory Council, Men's Inter-Dormitory Council, Pan-Hellenic, and Inter-Fraternity Council. These organizations deal with matters of particular interest to their membership.

Associated Student Organizations

This activity provides a central administration of business affairs for member organizations. A board of three faculty members and six students approves budgets of member organizations, recommends the amount of the Student Activities' assessment and sets standards for, and supervises the financial activities of, member organizations.

Student Organizations

Special Interest Organizations

There are about forty recognized student organizations for those interested in some special field, such as chemistry or sociology, or an activity, such as skiing and hiking, dramatics, radio, etc. In addition there are nine musical organizations.



HOMECOMING QUEENS

National Honorary Societies

ALPHA CHI SIGMA, Chemistry
 ALPHA EPSILON DELTA, Pre-Medical
 ALPHA KAPPA DELTA, Sociology
 ALPHA ZETA, Agriculture
 MORTAR BOARD, Student leadership, Senior Women
 PERSHING RIFLES, Military
 PHI BETA KAPPA, New Hampshire Beta Chapter
 PHI KAPPA PHI, Highest-ranking seniors selected from all Colleges
 PHI SIGMA, Biology
 PHI UPSILON OMICRON, Home Economics
 PI GAMMA MU, Social Science
 PI MU EPSILON, Mathematics
 PI SIGMA ALPHA, Government
 PI THETA EPSILON, Occupational Therapy
 PSI CHI, Psychology
 SCABBARD AND BLADE, Military
 SIGMA PI SIGMA, Physics
 TAU BETA PI ASSOCIATION, Engineering
 TAU KAPPA ALPHA, Debate and Oratory

Recognition Societies

SENIOR KEY, Senior men
 SOPHOMORE SPHINX, Sophomore men and women



WINTER CARNIVAL

Student Publications

The Granite is an illustrated annual published by the Senior Class. *The New Hampshire*, weekly newspaper, presents campus news.

Religious Organizations

THE CANTERBURY CLUB is an association of the Episcopal students on campus.

THE INTER-VARSITY FELLOWSHIP is an organization to promote Christian fellowship, Bible study, and prayer.

A CHRISTIAN SCIENCE organization welcomes all who are interested to its weekly testimonial services.

THE HILLEL SOCIETY is an organization to bring to Jewish students a more adequate knowledge of their heritage, and to foster friendship, cooperation, and understanding among the various religious groups. Activities include religious services, holiday observances, discussion groups, and the maintenance of a library relative to Jewish study which is open to all students.

THE NEWMAN CLUB, an organization of Catholic culture and fellowship, fosters the spiritual, intellectual, and social interests of Catholic students. It is a member of the Newman Club Federation. Activities include corporate communions, discussion study groups, lectures, dramatics, parties, dances, etc. A Reading Room is provided in New Hampshire Hall.

PHANARION SOCIETY, for students of the Greek Orthodox Church.

THE UNH CHRISTIAN ASSOCIATION is an organization to provide a Protestant chaplain and to maintain an adequate program of activities for the developing of Christian life in the students of Protestant affiliation of the University and to cooperate in the interfaith religious work of the campus. It is sponsored by the United Protestant Association, the Board of Directors of which is composed of representatives of Protestant churches in the State, parents of students, alumni, faculty, and students of the University, and the State YMCA and YWCA.

Fraternities and Sororities

FRATERNITIES* — Kappa Sigma, (1894) 1901; Sigma Alpha Epsilon, (1894) 1917; Theta Chi, (1903) 1910; Lambda Chi Alpha, (1906) 1918; Alpha Tau Omega, (1907) 1917; Phi Mu Delta, (1914) 1918; Pi Kappa Alpha, (1921) 1929; Sigma Beta, (1912); Phi Sigma Delta, (1922) 1924; Phi Kappa Theta, (1922) 1923; Alpha Gamma Rho, (1923) 1924; Phi Delta Upsilon, (1924); Tau Kappa Epsilon, (1925) 1932; Acacia, (1949) 1949.

SORORITIES* — Chi Omega, (1897) 1915; Alpha Chi Omega, (1913) 1924; Alpha Xi Delta, (1913) 1914; Phi Mu, (1916) 1919; Kappa Delta, (1919) 1929; Theta Upsilon, (1926) 1930.

The Alumni Association

Upon leaving the University of New Hampshire, students automatically become members of the Alumni Association. Reunions in June, Homecoming in the fall, alumni clubs throughout the country, and a monthly magazine keep alumni up to date with University activities.

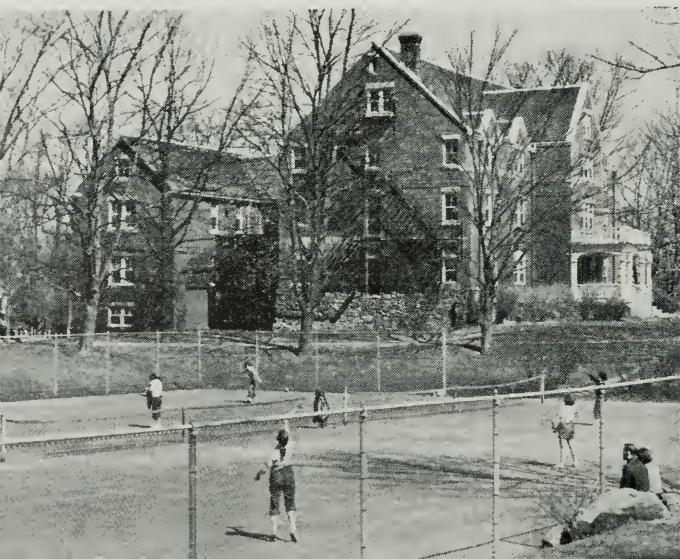
* The year in parenthesis is the date of founding as a local; the other year is the date the local joined a national fraternity.



DISCUSSION WITH CLEMENT ATLEE

Student Activities

TENNIS





CHEERLEADERS



STUDY

PAUL THEATRE





FOOTBALL

Student Activities

Continued



TRACK



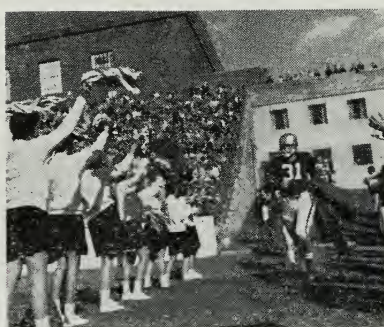
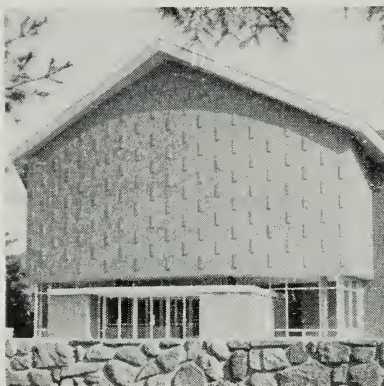
BAND



CARNIVAL TORCHLIGHTING

DISCUSSION WITH AARON COPLAND





Information About the University

History

Founded in 1866, the University of New Hampshire is one of the nation's land-grant colleges which were established by the Federal Morrill Act. The University had its beginning as a College of Agriculture and Mechanic Arts as a part of Dartmouth College in Hanover.

In 1892 the College was moved to its present site in Durham, to take advantage of the bequest of the estate of Benjamin Thompson, a prosperous farmer. He gave his land and money to the State on condition that an agricultural college be established on his Durham farm. Although the will was made in 1856, its terms were not disclosed until 1890, and by the time the estate became available in 1910, the gift in land and securities had grown from \$300,000 to about \$800,000.

Meanwhile, the State Legislature in 1890 took legal steps to establish the College at Durham, and in 1892 the Senior class enthusiastically held its commencement exercises in the first building which had been completed — a cow barn. Four other buildings were ready for use in 1893 by a group of 64 students, including four women.

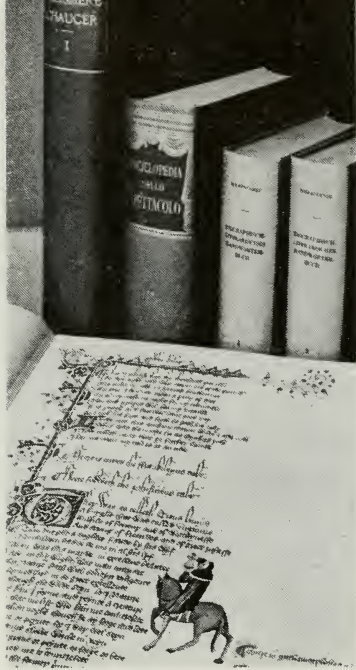
Steady growth since that time has resulted in an educational institution recognized as one of America's great state universities, with an enrollment of 3,800 students. In 1923 the State Legislature renamed the institution "The University of New Hampshire", creating within it the Colleges of Agriculture, Liberal Arts, and Technology.

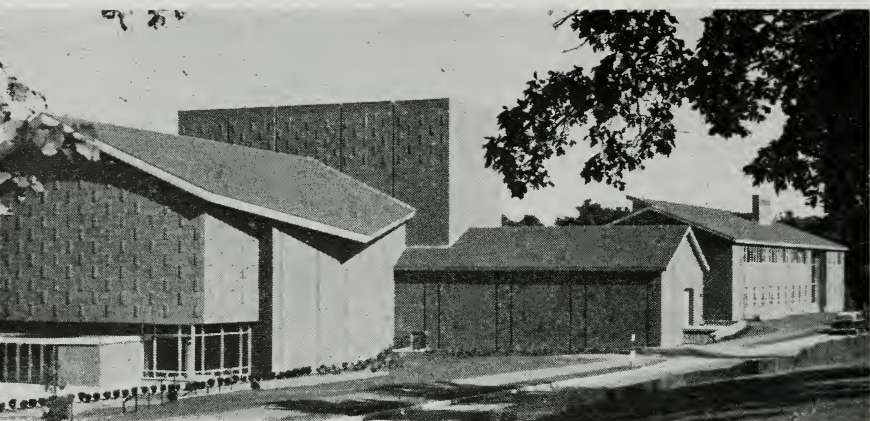
Two years later permanent support for the University was provided by the Legislature in its enactment of legislation granting an annual income of one mill for each dollar of the assessed valuation of all taxable property in the state. Since then the mill tax legislation has been amended so that state support of the University amounts to slightly more than \$3,000,000 annually.

Organization

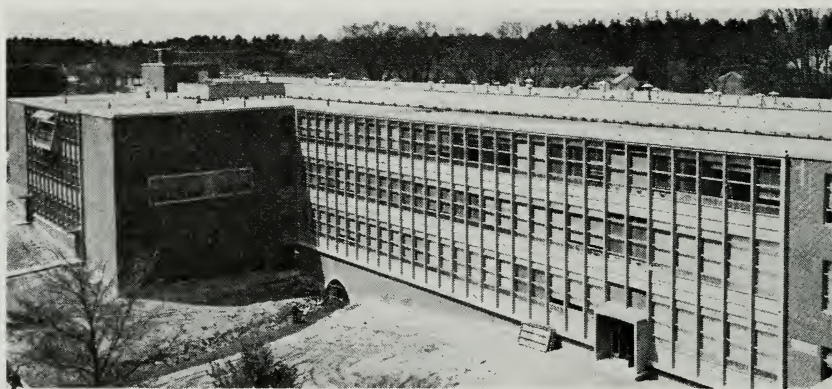
The University is governed by a 13-member Board of Trustees. The Governor of the State, the Commissioner of Agriculture, and the President of the University are members *ex officio*; eight members are appointed by the Governor; and two are elected by alumni.

Legislative jurisdiction in matters of student government and educational policy is held by the University Senate, a representative body of members of the Faculty. Within the Senate is the Faculty Council which acts in an advisory capacity to the President of the University.





PAUL CREATIVE ARTS CENTER



SPAULDING LIFE SCIENCE BUILDING

Land and Buildings

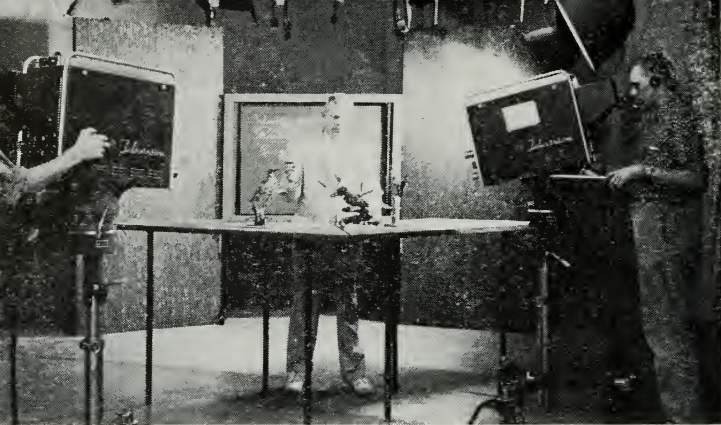
University lands comprise approximately 2,800 acres. Lands at Durham total about 1,500 acres, of which the campus proper and athletic fields make up 170 acres. The remainder are in forest, orchards and gardens, hay and pasture and ponds.

There are 31 buildings devoted to administration, instruction, and research, 18 residence halls for men and women students, an extensive farm system, and two buildings and several playing fields devoted to physical education and athletics for men and women.

Two new classroom buildings have recently been completed. The Paul Creative Arts Center, costing \$2,500,000, houses the departments of Music, The Arts, and Drama. The Spaulding Life Science building, built at a cost of nearly \$2,000,000, is used by the departments of Bacteriology, Biochemistry, and Zoology.



RANDALL AND HITCHCOCK HALLS



EDUCATIONAL TELEVISION

Services to the State

In addition to its regular program of instruction, the University conducts an active program for the benefit of the people of the state in related fields of higher education, such as extension work and research.

The Cooperative Extension Service, with a staff of more than 70, operates in conjunction with the U. S. Department of Agriculture to disseminate information by means of demonstrations, meetings, the press, radio, and individual contacts. The Cooperative Extension Service bridges the gap between the research done on the campus and the people of the state on their farms, in their homes, and in their communities.

The University Extension Service conducts an adult education program anywhere in the state where there is sufficient demand, making available instruction on a college level. It takes its classes into industrial plants for a specialized technological instruction or it will conduct classes in cultural subjects in liberal arts. In addition this Service arranges for campus conferences and meetings of state and national groups, and it operates a library of educational films.

Many research projects are being conducted by members of the faculty of the University. These are supported by various agencies of both the state and federal government as well as through grants



RESEARCH

from private industry. In addition to these individual projects there are three organized research units at the University — the Agricultural Experiment Station, the Engineering Experiment Station, and the Public Administration Service.

The Agricultural Experiment Station is concerned with solving the more important agricultural problems in an attempt to better rural life by bringing science to agriculture. Bulletins covering results of research are available for free distribution.

The Engineering Experiment Station provides engineering research facilities for the industries of the state and the state government. Although it does some independent research, much of its work is done in response to specific requests for technical assistance.

The Public Administration Service provides research facilities for government agencies of New Hampshire through the Department of Government, with assistance from other departments in the College of Liberal Arts.

The University operates an educational television station, WENH. Channel 11. Programs originate from studios in the Memorial Union, and they include in-school instruction for elementary and secondary schools of New Hampshire during daytime hours, and cultural and educational programs during the evening. The station is operated with the advice of the New Hampshire Educational Broadcasting Council, Inc., an organization made up of more than 20 colleges, preparatory schools, and educational associations.

Officers of Administration

ELDON L. JOHNSON, President

JERE A. CHASE, Assistant to the President

DAVID C. KNAPP, Assistant to the President

ROBERT N. FAIMAN, Dean of the College of Technology and Director of the Engineering Experiment Station

HAROLD C. GRINNELL, Dean of the College of Agriculture

JOHN F. REED, Dean of the College of Liberal Arts and Dean of the Graduate School

NORMAN W. MYERS, Treasurer

CHARLES M. WHEELER, JR., Acting Dean of Students

ROBB G. GARDINER, Associate Dean of Students

ELIZABETH A. MCQUADE, Associate Dean of Students

THELMA BRACKETT, Librarian

HARRY R. CARROLL, Director of Admissions

PETER JANETOS, Director of University Extension and Summer Session

PAUL E. SCHAEFER, Registrar

Further Information

The University welcomes visits to the campus, of prospective students, parents, and other interested people. Most University offices are *closed* on *Saturdays*, therefore it is recommended that persons planning to visit the campus arrange to come during weekdays, if possible. Students desiring appointments are encouraged to arrange for interviews before visiting the campus. General office hours are 8:00 a.m. to 12:00 noon and 1:00 p.m. to 4:30 p.m.

Correspondence in regard to the University of New Hampshire and its programs of instruction should be addressed to the following:

Admission to the Undergraduate Colleges

DIRECTOR OF ADMISSIONS
Thompson Hall, Durham, N. H.

Graduate School

DEAN OF THE GRADUATE SCHOOL
Spaulding Life Science Building, Durham, N. H.

Summer Session

DIRECTOR OF SUMMER SESSION
Commons, Durham, N. H.

Thompson School of Agriculture

HEAD, THOMPSON SCHOOL OF AGRICULTURE
Putnam Hall, Durham, N. H.

Agricultural and Home Economics Extension

DIRECTOR OF COOPERATIVE EXTENSION SERVICE
Thompson Hall, Durham, N. H.

University Extension

DIRECTOR OF UNIVERSITY EXTENSION SERVICE
Commons, Durham, N. H.

Alumni Activities

ALUMNI EXECUTIVE
Alumni House, Durham, N. H.



